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COMPUTERWORLD

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In Depth
Warnings about moving Cobol to micros
Follows 60

IBM warns users of potential harm to head disk units

By Tom Henkel
CW Staff

RYE BROOK, N.Y. — IBM has notified the approximately 10,000 users of its 3380 disk drives that using certain types of air-conditioning system antibacterial agents can cause head disk assembly problems, including head crashes.

IBM said it has discovered that a small percentage of 3380 users developed head disk assembly problems in buildings that use organometallic biocides, principally those that incorporate tin oxide. The biocide is a chemical used in certain types of air-conditioning systems to prevent growth of bacteria in stagnant water. Scientists blame such bacteria for causing potentially fatal illnesses, such as Legionnaires' disease.

An IBM spokeswoman said less than 2% of 3380 customers have actually reported head disk assembly problems traceable to use of the chemical. IBM

See **3380** page 8

DP fight brews at GM

Transferred workers seek to keep benefits

By John Desmond
CW Staff

FLINT, Mich. — General Motors Corp. data processing employees are fighting on two fronts — in the courts and via a fund-raising effort — against the perceived loss of benefits resulting from their scheduled transfer to Electronic Data Systems Corp. on Jan. 1.

Hearings will begin next month on the attempts of some GM DP workers to join the United Auto Workers union. See page 4.

A suit filed in U.S. District Court here Nov. 19 on behalf of two individuals alleges that the loss of certain retirement benefits by workers being transferred from GM to EDS is a violation of federal pension law. The suit was filed by attorney Jules Olsman of Southfield, Mich., on behalf of Thomas Omans and Gary Cattin of the GM Technical Center in Warren, Mich. The automaker acquired EDS for $2.5 billion in a merger approved by stockholders on Oct. 18.

Meanwhile, in an action that may eventually have broader repercussions, a corporation called Legal Fund to Restore Benefits, Inc. has been formed by several transferred GM employees to raise funds and bring focus to the legal efforts. One GM systems analyst said that each worker is being asked to contribute $100 until $50,000 is raised, and the analyst said he is very confident that goal will be reached. More than 300 workers attended an LFTRB meeting here in late November, and meetings have since been held in Detroit and Lansing, Mich.

GM and EDS are both required to respond to Olsman's suit within 20 days after being served. Olsman said the

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CW photo by J. Beeler

Sails pitch

Virtual Microsystems, Inc. took a novel tack in its effort to steal the attention of potential buyers at the recent Dexpo West '84 show. Story page 9.

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Five years' labor bears fruit. The Ansi X3J4 subcommittee has begun steps to pass its Cobol-80 standard. **Page 2.**

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Flying high in anticipation. Airline industry data centers and other big users of millions of instructions per second machines are preparing for the expected 1985 arrival of IBM's Sierra series mainframes. **Page 5.**

■

Not as compatible as it was thought to be. That is the consensus of several early users of IBM's Personal Computer AT. They also found several faulty data sectors in the AT's hard disk. **Page 6.**

■

The debate over VDT safety intensified last week as two national labor groups launched an 18-state lobbying campaign for legislation on VDT-related health issues. **Page 8.**

■

A large contingent of communications product vendors flooded Dexpo West '84, highlighting the growing industry demand for increased integration between Digital Equipment Corp. systems and those of other hardware vendors. **Page 9.**

■

The world is at his fingertips. A DP guru from the U.N. talks about life in a world of computerized global economic and social statistics. **Page 10.**

■

It'll be showdown time for IBM and NCR Comten, Inc. when they meet in court this month to battle over IBM's allegations that a consulting firm disclosed proprietary information. **Page 73.**

■

FYI

CAB prepares to ride off into 'sunset'

By Mitch Betts
CW Washington Bureau

WASHINGTON, D.C. — An independent agency of the U.S. government will actually go out of business Dec. 31. It will terminate, disappear or "sunset," as it is euphemistically called here. This unprecedented event is having some unprecedented effects on the agency's data processing office.

The independent regulatory agency headed for extinction is the Civil Aeronautics Board, a victim of U.S. Congress' 1978 decision to deregulate the airline industry.

When Congress passed the Airline Deregulation Act of 1978, the reaction at the CAB's DP shop was a mixture of shock, disbelief and uncertainty. "It was an emotional roller coaster here for the last two or three years," according to Bradley H. Hoke, chief of the DP division for the past 10 years. "We didn't know if we were going to have a job from one day to the next."

Hoke, in a recent interview, said that after the legislation passed and the CAB's regulatory powers were whittled away, the DP budget was tightened, the aging hardware could not be replaced and the DP staff dwindled from a high of 47 to a low of 15.

CW photo by M. Betts
Hoke

After years of unsettling rumors about the agency's fate, Congress settled the issue this year by approving the Civil Aeronautics Board Sunset Act, which states that the CAB will cease to exist Dec. 31, and most of its remaining regulatory functions will be transferred to the U.S. Department of Transportation.

"It was pretty obvious [after passage

See **CAB** page 7

NEWSPAPER

Cobol-80 nears final stages

Ansi committee close to completion of draft standard

By Paul Gillin
CW Staff

Drained by more than five years of continuous debate and facing increasing pressure from the international community, the American National Standards Institute (Ansi) X3J4 subcommittee, which is formulating the Cobol-80 standard, has begun its final steps to pass the draft standard into the last stages of acceptance.

If all goes smoothly, the draft could be sent to the parent Ansi X3 committee in April, X3J4 members said last week after the committee wrapped up its final meeting of the year. "We can see light at the end of the tunnel," said Jerome Garfunkel, president of Jerome Garfunkel Associates, Inc. in Litchfield, Conn., and a member of the X3J4 committee.

However, because of lengthy approval processes, a standard will not be approved until late 1985 at the earliest, they said. The document must still be approved by two other Ansi groups, either of which could call for more changes to the proposed standard.

But further changes are not likely to come from X3J4, members said. "The sentiment of the committee is to get on with it," said Lemuel Skidmore, vice-president of Online Systems Support, Inc. in Kensington, Conn., and vice-chairman of the X3J4 committee. "I think at the next meeting we will vote to pass the standard along to the [Ansi] X3 committee."

The X3J4 committee completed another round of public comment Nov. 14. At its most recent meeting in La Jolla, Calif., in mid-December, the group drafted responses to the 23 comments that were received.

The committee will reconvene in February in Baltimore to consider the final responses. If no substantive opposition arises, it will vote to initiate a ballot for X3J4 members to vote on the proposed standard, Skidmore explained.

The X3J4 committee will then reconvene in April to tabulate the ballots and probably to submit the proposed standard to the parent Ansi X3 committee. The X3 committee will then be responsible for sending the proposal to the Board of Standards Review, the Ansi committee that decides whether or not to approve the standard.

Skidmore called late 1985 an optimistic date for implementation. He noted that changes could be called for at any stage of the approval process, delaying the standard further.

Garfunkel said action by the International Standards Organization (ISO) in February to adopt a draft international standard before approval by the X3J4 committee has contributed to the Ansi group's willingness to proceed.

The ISO standard is parallel to the "Pink Book," which is now under consideration within Ansi. If the Ansi standard can be implemented as it now stands, it would lead to identical standards at both the national and international levels.

"That is very much on the minds of the committee right now for selfish reasons," Garfunkel said. "IBM, [Honeywell, Inc.] and the rest don't want to have to support two separate compilers."

IBM's VS Cobol II not Cobol-80-based

IBM's VS Cobol II compiler, which is due to be available in the first quarter of 1985, should not be mistaken for a Cobol-80 compiler, members of the American National Standards Institute's (Ansi) X3J4 committee cautioned last week.

The upgraded compiler is based on the existing Cobol-74 standard and includes many extensions that were part of the original draft standard for Cobol-80. However, that 1½-year-old document, also called the "Blue Book," has been revamped and differs from the proposed "Pink Book" standard in several significant ways, according to Jerome Garfunkel, president of Jerome Garfunkel Associates, Inc. in Litchfield, Conn., and a member of the Ansi X3J4 committee.

For example, the EVALUATE verb in VS Cobol II does not include an ALSO verb, which is included in the latest version of the standard. "If users start using this new feature, they will still have to make a miniconversion when the Cobol-80 standard is approved," Garfunkel said.

Lemuel Skidmore, vice-president of Online Systems Support, Inc. in Kensington, Conn., and vice-chairman of the X3J4 committee, noted that IBM may end up supporting three different compilers for the same language.

The company has committed itself to supporting existing VS Cobol compilers for three years while introducing a new compiler and planning to bring out a Cobol-80 version when the standard is finalized. Skidmore said customers should discuss the matter with IBM to ensure that a consistent upgrade path is provided.

Garfunkel cautiously advised users to upgrade to VS Cobol II to take advantage of the extensions. But he warned that some kind of conversion will probably be necessary when a Cobol-80 compiler becomes available.

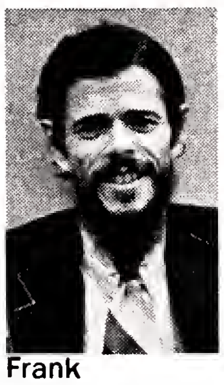
Ronald A. Frank, 1934-1984

MONT VERNON, N.H. — Ronald A. Frank, managing director of the Frank Communications Group and a former *Computerworld* editor, died last week after an extended illness. He was 50 years old.

A graduate of Farleigh Dickinson University in Teaneck, N.J., Frank joined *Computerworld* in July 1969 as a technical news editor. He left the newspaper as a senior editor/communications in September 1979.

Long-time acquaintance William Leitch, general manager of the Communications Networks national telecommunications conference, said Frank, a regular speaker at the conference, will be missed. "We were always surprised at what superb ideas came out of such a small package," Leitch said.

Molly Upton, a fellow editor during Frank's tenure at *Computerworld* and currently director of publications at International Data Corp., remembered him as a man "who kept a lot of us honest." Frank, according to Upton, was a man with "very high standards."


Frank

Before joining *Computerworld*, Frank had worked at Bendix Corp. and as a technical writer at Honeywell, Inc.

A member of the Institute of Electrical and Electronics Engineers, Inc., he held an MBA degree from Babson College, Wellesley, Mass., and had been pursuing a Ph.D. at Boston University.

He is survived by his wife and two children.

Memorial contributions can be made to a scholarship fund being established by another of Frank's fellow ex-*Computerworld* editors, Vic Farmer. Farmer resides at 14 Catherine St., Newport, R.I. 02840.

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What's the news?

Hard as we try to give our readers the most complete information available, some good news and feature stories never reach us.

Are you involved in an unusual application of DP technology in your company? Have you implemented successful cost-cutting strategies? Is something in your DP shop not working as designed? Know any unsung heroes? Heard any hot news about vendors? Are you aware of technology or management trends the trade press is overlooking?

If so, we'd like to hear from you. *Computerworld* has established a reader hot line for information regarding items of interest to the computing community. Call us toll free at (800) 343-6474. Ask for Donovan White, assistant managing editor.

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NLRB to review GM DP workers' unionization efforts

Hearings planned for next month; elections granting UAW representation may follow

By John Gallant
and John Desmond
CW Staff

> *'We will vigorously oppose any effort to form a union in EDS. We feel strongly against the unionization drive because there is no need for it. There is no place for it within EDS. I am confident that no union is going to be formed.'*
> Ken Riedlinger, senior vice-president, EDS

DETROIT — Hearings before the National Labor Relations Board (NLRB) are scheduled to begin next month on the attempts by some soon-to-be-transferred General Motors Corp. DP workers to win representation by the United Auto Workers union (UAW).

The NLRB told *Computerworld* last week that preliminary hearings will be held Jan. 7 to review four petitions the UAW submitted in late November on behalf of salaried GM DP employees seeking to become members of the union. The petitions were signed by workers at four GM facilities who were concerned about the perceived loss of benefits involved in the transfer of GM's DP and communications employees to the payroll of Electronic Data Systems Corp. (EDS) [CW, Nov. 12].

Following the hearings, the NLRB may approve elections for workers at four GM units — the Fisher Body facility at the GM Technical Center in Warren, Mich.; a unit at the GM assembly facility in Willow Run, Mich.; and the GM Photographic Division and the GM Information Systems and Communications Activities unit at GM headquarters in Detroit.

A UAW spokesman was quoted in local press reports as saying that the petitions seek UAW representation for 324 workers at those units, although the union would not confirm that figure. If elections are held, a simple majority vote by workers in the proposed bargaining units would make the employees members of the UAW. GM currently employs some 7,000 DP workers at more than 115 locations within the U.S and another 3,000 at facilities outside the country. On Jan. 1, the automaker's U.S. DP staff is scheduled to be transferred to EDS, which was acquired by GM for $2.5 billion in mid-October.

According to a UAW spokesman, the drive for union representation began in early November after several GM DP workers approached the UAW following EDS' unveiling of its salary and benefits package. The spokesman said the union then began holding informational meetings — which sources within the automaker's DP operations said were attended by several hundred employees — and later sponsored petition drives within GM facilities.

Although the UAW declined to discuss the number of facilities involved in the petition drive, a union spokesman was quoted earlier as saying that, in addition to the four named units, the UAW was attempting to organize 25 other U.S. locations where GM DP workers are employed.

Several sources within GM's DP operations, who asked not to be named, said the unionization efforts were spawned by fears of a reduction in benefits following the transfer of workers to Dallas-based EDS. In addition to the UAW petition drive, employee concerns have manifested themselves in proposed legal action against GM and its newly won subsidiary (see story page 1).

The sources said workers were upset over the loss of annual cost-of-living allowances and overtime pay, changes in the structure of retirement plans and reductions in dental, vision and dependent health care benefits. EDS maintained that the transferred workers would be compensated for benefits changes with what the company described as a generous stock giveaway plan [CW, Nov. 12] and merit raises larger than those generally awarded by GM.

NLRB regulations require that at least 30% of the employees in a proposed bargaining unit sign the petition seeking elections for union representation. Although the UAW would not specify the percentage of GM workers involved in the petition drive, a union spokesman confirmed an earlier statement that more than 60% of the workers in the four units had signed.

"We are pleased with the progress of the campaign," the UAW spokesman said. "There will probably be separate elections for each petitioning unit. How many workers eventually come into the union depends on how many elections are held and how many of those elections are successful. If any of the units vote to join the union, we intend to arrange bargaining [with EDS] right away."

According to Henry Chiles, assistant to the regional director for Region Seven of the NLRB, the preliminary hearings will focus on the structure of the proposed bargaining units. Discussions will likely involve the job titles to be included in the units and the size of the employee groups for which elections could be held.

"The NLRB really controls the time period for the elections. It can be as short as a few weeks, or it could be months," the UAW said.

'UAW effort to increase rolls'

According to Ken Riedlinger, senior vice-president with EDS, only a very small percentage of GM employees actually want union representation. "I think it is the UAW trying to get the salaried workers to unionize, rather than the other way around," he said. "The thing you need to understand is that this is really not a GM/EDS issue; this is an effort by the UAW to increase its rolls. It really has very little to do with the merger.

"EDS is certainly opposed to any union occuring within EDS, and we will vigorously oppose any effort to form a union in EDS," Riedlinger said. "We feel strongly against the unionization drive because there is no need for it. There is no place for it within EDS, and I am very confident that no union is going to be formed."

One GM DP worker, a former UAW member, said he would not support the union's efforts. "The union takes everybody to the middle," he said. "If you are a highly motivated, success-oriented employee and the guy sitting next to you just wants to collect a paycheck and be comfortable, you are both going to get the same pay. I am not interested in being in the middle. I am interested in being on top."

EDS from page 1

deadline will be reached this week.

Asked to comment on Olsman's suit, EDS Senior Vice-President Ken Riedlinger said, "It has no merits, and I think you will find that we will win. There are preliminary legal — I hate to use the word maneuverings — actions being taken in response to that suit. We are investigating their allegations." GM spokesman William Winters had no comment on the suit. He confirmed that the EDS retirement package does not include early retirement after 30 years of service, as does GM's package.

Attorney Donald Gasiorek of Somers, Schwartz, Silver and Schwartz, P.C. of Southfield, who said he was asked to get involved with LFTRB by some GM employees, said taking on GM would be "an expensive proposition."

"Their intent is to retain the benefits they had at GM," Gasiorek said of the LFTRB backers. "The question is how good is it for EDS to suddenly wind up with 10,000 disgruntled employees. You don't want people so distraught it has an impact on productivity," he added.

Neither GM nor EDS spokesmen had any reaction to the fund-raising activities. GM spokesman Winters said he was aware of the fund and added, "All I know is what I read in the paper." A spokeswoman for EDS said last Wednesday the company was not aware of the LFTRB fund.

Both lawyers said the actions are unusual, because when the larger company — GM — acquired the smaller company — EDS — the employees of the larger company were apparently given the same benefits as the employees of the smaller company.

"Usually, a smaller subsidiary becomes part of the larger whole. Here, you have the reverse. GM is putting the employees in a smaller subsidiary and reducing their benefits," Gasiorek said. According to Olsman, "The whole transaction is going to break significant new legal ground in the area of employment law. Everyone is at a loss to find a precedent."

He added, "GM offers a better benefits package to its employees than EDS does. You're talking about the biggest corporation in the world. If it works in uninterrupted fashion for GM, no one would be surprised to see [Ford Motor Co.] and [Chrysler Corp.] do it. It is an excellent move from management's point of view. They save the company hundreds of millions of dollars in benefits."

The two legal actions differ in scope. "I'm relying on statutory authority, and they're relying on case law evolved over seven years," Olsman said . He noted that his suit alleges a violation of the federal Employment Retirement Income Security Act, because employees who would have been eligible to retire after 30 years of service with GM would not have the same benefit at EDS. Olsman called this a "wrongful deprivation of vested pension rights."

Citing a case of potential hardship resulting from the transfer, Olsman said he was approached by two GM employees with multiple sclerosis, who at times have had to take disability leaves from GM. "GM gives them disability benefits; EDS doesn't have them," Olsman said. "If these people fall into a situation where they have to leave work, they're out. There's no legal protection for them" at EDS, Olsman said.

An EDS spokeswoman disagreed with Olsman, saying that any "preexisting condition" that qualified for health benefits at GM would also be covered by EDS.

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Airlines ready DP centers in anticipation of Sierra

By John Desmond
CW Staff

TARPON SPRINGS, Fla. — The Sierra series of mainframes has not yet been announced by IBM, but users with bulging processing demands are nevertheless preparing their data centers for an anticipated 1985 arrival of the high-end IBM series.

Analysts project that the initial Sierra will offer at least 29 millions of instructions per second (Mips) processing power at a price more favorable than 3080 series mainframes.

The heavy Mips-using data centers at commercial airlines, which process on-line reservation systems, are especially anxious for Sierra's arrival. According to Gerald Doherty, director of computer operations at Trans World Airlines, Inc. (TWA), "The demands are such that we will need another large uniprocessor in an early-1986 time frame."

Doherty said TWA's data center currently uses a 3033 CPU in tandem with high-performance version 3083 CPUs. "To help us bridge from our current capacity through 1985, we've implemented a support processor using an IBM 3033 in a form of multiprocessing," Doherty said. In a method transparent to users, the 3033 is used to answer all inquiries on seat availability, while the 3083s perform the reservation function. "The 3033 is thought of as a helper processor," Lewis said.

If the Sierra is delayed beyond its expected spring announcement, Doherty said, "other individual packages can be off-loaded based on need. But you do reach a practical limit for that concept to work. If Sierra is not announced in early 1985, we'll have to move additional loads to helper processors." Another possibility is to upgrade the helper 3033s to 3083s, he said.

Anticipated MVS/XA-only support

United Airlines, Inc. is converting its mainframes to the MVS/XA operating system in preparation for Sierra, which is expected to support only extended architecture, according to James Peyton, systems engineer with United's Chicago data center.

In its three data centers, United runs 9083s and 9081s, which are 3083 Model JX and 3081 Model KX specially modified by IBM for the airline industry. If Sierra is announced in the spring, United plans to replace its 9081s with Sierras, Peyton said. If Sierra is delayed beyond the summer, when United will need more processing power, the company will either go to a 3084 configuration or buy another processor, neither of which is as attractive an option, Peyton said.

To move from a 9081 to a 3084 Model QX, United would have to spend approximately $500,000 to make the 9081 look like a 3081, and in the process "enhanced Thermal Conduction Modules would have to be yanked out and more standard products installed," Peyton said. United would then have to upgrade the 3081 to a 3084, he said. "That is not financially attractive to us, because there is no migration path from a 9081 to a 9084; there's no such box," Peyton said.

Projections that Sierra would offer more processing power in the same or less floor space are also attractive to United, which has limited floor space in its data centers.

Dalton Wiley, American Airlines, Inc.'s manager of capacity planning, said, "We want Sierra now. We need more capacity." American is running its reservation system on four 9083s running the Airline Control Program (ACP). Since ACP would not run on an extended-architecture-only machine, American is now investigating what code changes would be needed to allow the software to run in extended architecture mode, Wiley said.

Wiley also said it is difficult for him to plan because the product's details are so uncertain. "What we're really after is some information as to whether it will be [extended-architecture-only]," he said. "We need some [specifications] so we can do some planning." He said American will consider entering IBM's Early Ship Program when the product is announced "if that's what it takes to get it early."

American has a backup plan should Sierra be announced later than expected. "Our contingency is to run more than four machines simultaneously," Wiley said. Changes by American's own programmers will allow up to eight CPUs to run ACP concurrently to gain needed capacity, he said. But the fallback position has the drawbacks of "investment in today's technology when tomorrow's is right around the corner," as well as the added complexity of more multiprocessors plus added personnel and operations costs, Wiley said.

Airlines are not the only users planning for Sierra. When the long-term 3033 mainframe lease of Martin Marietta Data Systems, Inc. in Orlando, Fla., runs out in 1985, the company plans to obtain a month-to-month lease in order to bring in Sierra sooner, according to E. Britt Crawford, manager of performance and tuning. His shop runs a total of six 3033 and 3084 mainframes. "We feel the Sierra will be available in June," he said, but if the product is delayed beyond July or August, "we'll have to decide on another 3080 series" mainframe, he noted.

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IBM AT falls short in Personal Computer compatibility

By Edward Warner
CW Staff

Early corporate users of the IBM Personal Computer AT say the unit is not as IBM Personal Computer-compatible as they had expected and that its optional 20M-byte hard-disk storage unit has faulty data sectors. But on the whole, they are happy with the machine, and some are even planning to buy it instead of the IBM Personal Computer XT.

Introduced in August, the Personal Computer AT features an Intel Corp. 80286 microprocessor that is nearly twice as fast as the Intel 8088 in the Personal Computer. It also offers from 256K to 3M bytes of random-access memory (RAM), a choice of 1.2M- or 360K-byte diskette drives, 20M-byte hard-disk storage and a somewhat redesigned keyboard.

The users, few of whom had worked with the AT for more than a month, said they like the AT's speed and storage capacity and would put it to use for work with spreadsheets and data base management systems (see story page 7). They tempered their praise with some criticism, however.

Software incompatibility

Most complaints centered on compatibility with the software, storage peripherals and add-on boards designed for the Personal Computer. Several users also voiced unhappiness with the inability of the AT's 1.2M-byte diskette drives to write in a format that can be read by the 360K-byte drives of the Personal Computer.

According to Richard Strauss, vice-president for products at Corporate Software, Inc. in Waltham, Mass., only about 35% of the Personal Computer's software base has been certified as usable on the new machine. He indicated that most popular applications packages will run, but Max Hughes, vice-president of systems and computing at the pharmaceuticals division of New York-based Pfizer, Inc., said he is unable to use Ashton-Tate's Framework integrated package. A version of Framework has since been announced for the AT.

Compatibility problems have also arisen when some users tried to insert communications add-on boards for the Personal Computer into one of the eight expansion slots of the AT. Roy Hill, chief programmer in the technical support section of Michigan Blue Cross/Blue Shield, said he found the Hayes Microcomputer Products, Inc. Smartmodem board would not work in any of his firm's four ATs.

Bad disk sectors

For users with the 20M-byte internal hard disk, the most common complaints involved disk sectors. Bob Lane, microsystems consultant for Merrill Lynch Pierce Fenner & Smith in New York, said one 20M-byte storage unit has 40K bytes worth of bad sectors with which his office is stuck until the disk's data can be backed up and the disk reformatted.

An IBM spokesman, meanwhile, admitted that 20M-byte storage units had been shipped with as many as 10 faulty sectors but added that the units were still in line with IBM's requirement of a minimum capacity of 21.8M bytes of usable storage. "We do not ship drives that fall out of an acceptable range of quality," he said.

Other problems cited by users included the following:

■ Inability to access full potential RAM. The current lack of access, under IBM's PC-DOS operating system, to the AT's full potential for 3M bytes of RAM, led Moore McCormack Resources, Inc. to put off an AT purchase, at least for now, according to its controller, Andrew Langlois.

■ Backup system needs. One user criticized what he called IBM's failure to offer a backup storage system for the AT, while another said the AT is not compatible with the popular Iomega Corp. Bernoulli Box storage system for the Personal Computer.

■ Keyboard only slightly changed. Several users said IBM has yet to incorporate what they see as needed changes to the Personal Computer keyboard. Instead, they said, changes found in the AT keyboard are small but are still significant enough to confuse users.

■ Screen update speed. Though the AT recalculates data quickly, one user said it is somewhat slow in updating screens of information.

Another corporate user pointed out that the AT can be upgraded from 512K bytes to its full 640K-byte RAM capacity only by addition of a 128K-byte memory add-on board available only from IBM.

Some users have no problems

On the positive side, problems with the 20M-byte hard-disk unit are not being reported by all users. Five corporate micro specialists said they had experienced no problems with their ATs' hard disk, but one of them, Hank Kee, vice-president for personal computing at New York's Chemical Bank, said he encountered other issues with the machine.

Kee said that among those issues was what he termed the lack of a viable backup system from IBM. Streaming tape drives are available from third-party vendors, he noted, but users must otherwise establish backup using a series of diskettes.

Another corporate user knocked the machine's lack of a detachable keypad, something he said would be especially useful for entering data to a spreadsheet. He said his firm's AT users find the AT's keypad so debilitating that they usually use the numbers at the top of the keyboard for numerical entries.

Why are users having problems with the much heralded machine? According to micro industry analyst Aaron Goldberg of Framingham, Mass.-based International Data Corp., IBM is "letting the power users [of the AT] shake it down fully" while making a profit on AT sales.

Power users most tolerant

The power users, Goldberg claimed, "will be the most tolerant of faults" and will put the machine to its toughest tests.

Dan Spinner, chief operating officer of Management Information Software, Inc. in New York, said problems with the 20M-byte hard disk were arising because IBM is "pumping them out much faster than they can get good quality control." An IBM spokesman responded to Spinner's claim by saying the drives are tested throughout their manufacturing process.

Though some users are enamored enough of the Personal Computer AT to see it as the eventual standard for their firms, others are not promoting the machine until they satisfy their concerns about users' needs, the Personal Computer AT's compatibility and its hard-disk quality problems.

The wait is the drawback

The greatest problem for users of the IBM Personal Computer AT may not be software incompatibility with the IBM Personal Computer, hard-disk data losses or getting used to a somewhat rearranged keyboard.

It could be the wait.

The Commercial Banking Group of San Francisco's Wells Fargo Bank, N.A. was among the first to order Personal Computer ATs, purchasing three units shortly after the machine was introduced Aug. 20, according to the group's senior systems analyst, Kingsley Mar. Mar said he is now "pacing the loading dock. They are due any day now."

The Budd Co., a Madison Heights, Mich., automotive parts manufacturer, also was an early buyer of the Personal Computer AT but does not expect to receive its first unit until early next year, reported Larry Hamilton, management information services director

Overall, "availability is a pain," according to Rich Reed, microcomputer manager with Cigna Corp. of Bloomfield, Conn., which has 10 to 20 ATs on order. Reed, who placed his order about a month ago, said his supplier has told him that orders being placed now will not be filled until March.

All that should change, however, according to data compiled by International Data Corp. (IDC), a Framingham, Mass., research firm. Though AT shipments in 1984 will total only 25,000, IBM will ship as many as 300,000 ATs by the end of next year, according to IDC analyst Steve Bosley.

Ironically, the demand for new machines may have limited the supply of demonstration models as well, according to Cigna's Reed. Reed said the AT loaned to his office by an IBM sales representative had seen so much intensive duty at other demo sites that, when it arrived at Cigna, "it looked like it had been dumped off a truck."

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CAB from page 1

of the Sunset Act] that deregulation was a fact and was not going to be turned around," he said.

For Hoke, this was an important step because it meant he could begin planning for the transfer of the DP division's personnel, hardware, software and magnetic tapes to the DOT computer center. "The fate of the [Civil Aeronautics Board] had to be decided first, before we could get into that [planning] detail," he said.

During the last six to nine months, Hoke and DOT officials have worked out details on how to transfer hardware, maintenance contracts, personnel, software, data services and magnetic tapes. The applications programs and data files will not be changed by the transfer, so no new user training will be needed, Hoke pointed out.

"Our basic objective has been to make the transition without any serious degradation of support services," Hoke said. "We're in excellent shape right now" for the transfer on Jan. 2-3, he said.

Although most of the CAB's peripherals will be transferred directly to the Transportation Computer Center, Hoke said DOT officials insisted on replacing the CAB's mainframe with an IBM 4381. The old CAB mainframe, installed in 1975, is an IBM 370/155 Model II, which Hoke explained is an IBM 370/155 fitted with a dynamic address translation facility to make the CPU equivalent in throughput to an IBM 370/158.

By replacing the old CPU at the same time as the transfer, Hoke said, "I guess you could say we're killing two birds with one stone."

At DOT, the receiving end of this transfer, absorbing the CAB hardware will go smoothly because the modern Transportation Computer Center had the space, power and air-conditioning available to handle the additional equipment, according to Don Southern, special projects officer.

But Southern said the installation of about 50 terminals and a communications network for the new users has been a headache. He said that high-level managers were slow to decide which users would be performing particular functions and in what offices. Until recent meetings resolved those details, it was difficult to plan how many remote cluster controllers were needed or how to run coaxial cables from the computer room to the offices, he said.

Hoke will join DOT's Office of Information Systems and Telecommunications Policy, while his staff will move to the Research and Special Programs Administration. "If we felt like boat people, this would be a terribly traumatic experience. But the reception we've had has been one of respect — very positive — and we're grateful for that," Hoke said.

AT over XT?

By Edward Warner
CW Staff

Corporate users of the IBM Personal Computer AT contacted by *Computerworld* said the machine's speed — roughly twice that of its predecessor — and its optional 20M-byte storage capacity outweigh its compatibility problems with the software and peripherals of the IBM Personal Computer.

Most said they will pass up purchasing the Personal Computer XT in favor of the AT — priced only several hundred dollars more — and several even said they expect to make the AT the cornerstone of their office's personal computing.

The majority of microcomputer managers, a dozen of whom were interviewed over the past week, said their firms bought the AT in its enhanced version, with 512K bytes of random-access memory (RAM), a 20M-byte hard-disk storage unit and 1.2M-byte and 360K-byte diskette drives. The machines, they said, would be used by their firms' experienced personal computer users in working with spreadsheets and data base management systems.

Several wondered how extensive the use of the ATs would become. "I'm not all that sure we need as much power as the AT represents," said Larry Hamilton, management information services director of the Budd Co., a Madison Heights, Mich., auto parts manufacturer.

Others, though, were not so uncertain about their firms' need for personal computing power. "The main aspect is the speed," said Tom Thibault, vice-president of the Real Estate Industries Group of Wells Fargo Bank N.A. in San Francisco. Thibault said he favored the AT's speed because, "I can get hard-disk storage [in] a variety of ways."

That speed increase might make for as much as a 10% to 20% boost in productivity among those working with large spreadsheets or data bases, estimated Robert Wasserman, a consultant in the management consulting division of Peat, Marwick, Mitchell & Co.'s Minneapolis office. Wasserman said the arrival of the firm's new Personal Computer AT was timely because his office was bumping up against a need for greater memory capacity among the other 15 to 20 Personal Computers already in use there.

In Wells Fargo's Commercial Banking Group, senior systems analyst Kingsley Mar said the organization "hopes to make the AT the cornerstone of all of our offices." The group's first three ATs are on order, each with 640K bytes of RAM, 1.2M- and 360K-byte diskette drives but no 20M-byte hard disk. Mar said the group would rather buy its own 60M- or 80M-byte hard-disk units from third-party vendors.

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STC, others eye tin oxide

By Tom Henkel
CW Staff

While IBM appears concerned that organometallic biocides can cause damage to some of its disk drives, makers of competing products using the same basic technology do not appear to be as worried.

IBM-compatible disk drives manufactured by Memorex Corp. and Storage Technology Corp. (STC) use the same flow-through technology which draws air through the drive's head disk assembly for cooling. But neither firm has been able to identify head disk assembly failures caused by tin oxide contamination. Spokesmen for both Memorex and STC, however, admitted that their drives have been in the field roughly half as long as many IBM 3380s. The spokesmen both said IBM's 3380 head disk assembly problems developed after the units had been operating for about a year. The bulk of STC and Memorex 3380-compatible drives has been installed in the past four to six months.

Randy Watson, STC's disk product manager, said his company is also recommending that users discontinue use of organometallic biocides in computer rooms. But Watson said there only appears to be a potential for damage to head disk assemblies when tin-oxide-based biocides are introduced into air-conditioning systems in large quantities. Watson contended that if the chemical is used in the quantities recommended by chemical manufacturers, the environment should be safe for disk drives.

STC originally decided to recommend that the use of organometallic biocides be restricted to chemical manufacturers' recommended levels. But since chemical manufacturers' recommended levels for the biocide appear to differ, STC decided to alter its position. STC researchers have discovered that many air conditioner maintenance personnel consistently misuse organometallic biocides. Watson explained that organometallic biocides are typically introduced into water flowing through an air-conditioning system at rates greater than the recommended dose of roughly five drops per 1,000 gallons of water.

Memorex has not yet determined whether organometallic biocides are having an adverse effect on its 3680 drives. Memorex has not discovered any 3680 head disk assembly problems directly attributable to tin oxide contamination. The three other makers of 3380-compatible disk drives, Control Data Corp., National Advanced Systems, Inc. and Amdahl Corp., each said their 3380-compatible drives use a sealed head disk assembly unit and therefore appear to avoid tin oxide contamination problems.

Groups to push VDT bills

WASHINGTON, D.C. — Two national labor groups last week launched an 18-state lobbying campaign for legislation on VDT safety. The Service Employees International Union (SEIU) and 9 to 5, the National Association of Working Women, plan to use their "collective clout" to push for VDT legislation in each of the 18 states targeted, according to Elaine Taber, program director at 9 to 5.

Karen Nussbaum, president of District 925 of the SEIU in Cleveland and a 9 to 5 director, said the "Campaign for VDT Safety" will consist of a traditional effort to lobby for the legislation. Letter-writing campaigns, educational programs and discussions with legislators are planned in each state.

Discussions will focus on two types of legislation: bills addressing VDT ergonomics, requiring installation of things like adjustable keyboards and chairs and glare reduction screens, and a bill giving employees a "right to know" the specifications of VDT machines.

To date, VDT safety bills have only been filed in Massachusetts, which has the earliest filing deadline, 9 to 5's Taber said. That bill, sponsored by 9 to 5, the SEIU and the AFL-CIO, deals primarily with ergonomic issues. It makes the state's Department of Labor and Industries responsible for enforcing regulations on semiannual inspections of VDTs, eye exams for employees and transfers of pregnant VDT workers.

NAS reassigns personnel

MOUNTAIN VIEW, Calif. — In an effort to "streamline operations to better deal with the increasingly competitive data processing industry," National Advanced Systems Corp. (NAS) on Dec. 10 reassigned some of its 1,150 U.S. employees and placed others on surplus status, according to a company spokesman.

The employees include roughly 70 people from headquarters and field services, according to an anonymous source. Personnel on surplus status will be paid for 30 days, during which they can interview for positions within National Semiconductor Corp., the parent company of NAS. After that period, these employees will officially be laid off.

The employee cutback is part of an NAS corporate directive to reduce the company's expenses by 20%, according to the anonymous source, who was uncertain what percentage the personnel changes would contribute. The NAS spokesman said that chances are very good that all employees will find jobs within National Semi, which has a worldwide work force of 42,000.

3380

from page 1

is recommending that all users of 3380, 3370 and 3375 disk drives discontinue use of the organometallic biocides. The spokeswoman added that, so far, only 3380 users have actually reported head disk assembly problems, and only they have been formally notified of the potential problems. International Data Corp., a Framingham, Mass., market research firm, estimated that IBM has installed roughly 90,000 3380s at approximately 10,000 user sites.

The IBM spokeswoman added that a notice, which has already been added to IBM technical documents, includes the 3370 and 3375 disk drives as a precaution. She said no head disk assembly problems have been reported on the 3370s and 3375s.

While IBM is not recommending that users stop using biocides, it is recommending that use of organometallic biocides be discontinued. Other biocides apparently do not have an effect on the IBM disk drives. A spokeswoman emphasized that while the organometallic biocides can cause problems in IBM equipment, there is no apparent health risk to workers in buildings where the chemicals are used.

The potential problem stems from the basic design of 3380, 3370 and 3375 head disk assemblies. These units draw air from the computer room to equalize pressure and cool the head disk assembly. While the air passes through a three-stage filter that can eliminate particulate matter down to the submicron level, the biocides enter the head disk assembly in a gaseous form.

Ford Motor Co. in Dearborn, Mich., has experienced 3380 head disk assembly problems, which IBM attributed to tin oxide contamination. A Ford executive, who asked not to be identified, called the contamination a nuisance that took several months to resolve. "It wasn't like all the 3380s were going down at once," he said, noting that only a small number of the firm's 3380s actually developed head disk assembly problems.

IBM recommended that Ford stop using the organometallic biocide and clean the tin oxide residue out of the computer room. Ford complied but still experienced intermittent head disk assembly failures, although the frequency of the failures appeared to decline. The failures continued to diminish with time, the executive said, noting that about three months after discontinuing use of the organometallic biocide, "the problem appears to be behind us."

Other large users of IBM disk drives whose air-conditioning units used the organometallic biocide also admitted experiencing a higher than normal incidence of head disk assembly problems when contacted last week. But they could not say whether the problems were attributable to the organometallic biocide used in their shops.

The IBM spokeswoman declined to explain exactly what potential problems the organometallic chemicals can cause, but she said 3380s that have developed head disk assembly problems attributable to tin oxide contamination have been replaced without charge. Some industry observers contend the buildup of tin oxide on read/write heads and disk platters can cause head crashes. Others, however, contend tin oxide contamination can cause other mechanical problems within the head disk assembly, such as short circuits in read/write head and actuator arms and damage to the disk media.

Bob Arnold, a technician with Empire Engineering, Inc., a Quincy, Mass., air-conditioning contractor specializing in computer room systems, noted his firm does not recommend the use of organometallic biocides because they have been known to cause mechanical problems with other types of machinery, such as the machinery used in air-conditioning systems. Arnold added that relatively few buildings use air-conditioning systems that require the biocides.

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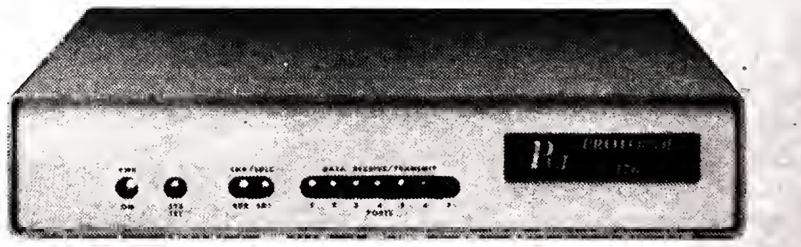

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Communications tools in spotlight at Dexpo West '85

CW AT DEXPO WEST

By Jeffry Beeler
CW West Coast Bureau

ANAHEIM, Calif. — Like most other users, customers in the Digital Equipment Corp. orbit are increasingly demanding gateways to the non-DEC world and networking capabilities of their own.

In response, hardware and software vendors have recently stepped up production of DEC-oriented communications aids, according to Steven Barth, marketing vice-president for Expoconsul International, Inc.

Probably nowhere was the DEC community's growing emphasis on systems integration more clearly in evidence than at the sixth national DEC-Compatible Industry Exposition (Dexpo) West '84 here Dec. 11-14. Of the approximately 280 vendors that exhibited at last week's Dexpo at the Disneyland Hotel Convention Center, 60 or 65 were demonstrating communications products, Barth said.

Hardware, software split

Barth, whose Princeton, N.J.-based company sponsored Dexpo, characterized the data transmission aids as split fairly evenly between hardware and software. On the hardware side were offerings like fiber-optic links, modems and statistical multiplexers. Software packages included local networking facilities, electronic mail programs and micro-to-mainframe links.

Many of the communications products displayed had already been on the market for quite some time, like IBM's family of Device Attachment Control Units, which reportedly allow IBM processors to swap information with their DEC counterparts.

But a few of the Dexpo-showcased transmission aids made their formal industry debut at the show. Some newcomers included the following:

- Ross Systems, Inc.'s Maps/Microlink, a software package that reportedly enables spreadsheets running on an IBM Personal Computer to share data with Ross' DEC VAX-based accounting and decision-support applications.
- Data Processing Design, Inc.'s Wordlink, which reportedly allows IBM Personal Computers or Personal Computer XTs supporting Wordstar or Multimate to gain access to VAX series mainframes.
- A Univation, Inc. controller board that is said to permit DEC Rainbow personal computers to be tied together to form full-fledged local networks.
- National Information Systems, Inc.'s Teleport II, a program that reportedly connects micros such as Rainbows and IBM Personal Computers to each other or to larger CPUs such as VAXs, Decsystem-10s and Decsystem-20s.
- An enhanced release of Exceptional Business Solutions, Inc.'s WPS-80, a Rainbow-based word processing package that, for the first time, can transmit documents among DEC micros running CP/M.
- Able Computer, Inc.'s Softswitch feature, which, with the vendor's Attach terminal system, reportedly allows users of DEC Unibus processors to gain access to host CPUs, data files and applications.

Ross Systems' Maps/Microlink costs $10,000 and is available from its developer at 1860 Embarcadero Road, Palo Alto, Calif. 94303.

National Information Systems' Teleport II, by contrast, costs $5,000 for a basic license covering one mainframe and five micros and is available from the company at Suite 130, 20370 Town Center Lane, Cupertino, Calif. 95014.

Data Processing Design's Wordlink sells for a one-time fee of $1,300, plus $200 per Personal Computer and is available from the vendor at 1400 N. Brasher St., Anaheim, Calif. 92807.

Univation's local network controller board is priced at $750, with the associated software costing an additional $750 and can be bought from the firm at 1037 N. Fairoaks Ave., Sunnyvale, Calif. 94089.

The enhanced release of Exceptional Business Solutions' WPS-80 package costs $195 and is available from Suite J, 11738 Moorpark St., Studio City, Calif. 91604.

Able Computer's Softswitch communications feature licenses for a one-time fee of $1,000 and is available from Able at 3080 Airway Ave., Costa Mesa, Calif. 92626.

Integration with other systems

For Barth, the comparatively heavy concentration of communications-oriented products and vendors reflects a growing desire among DEC users to integrate their systems, not just with other DEC equipment models but with competitive gear as well — especially IBM's.

"Most of the people attending this show . . . want to find ways of getting more out of their current systems by attaching them to products from other vendors," he said.

Especially appealing to DEC users, he added, is the prospect of connecting their systems to the growing population of IBM micros or of integrating Big Blue's mainframes with VAXs operating in manufacturing and engineering environments.

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DP chief at U.N. keeps tabs on worlds' worth of data

NEW YORK — Sidney Cashton has the world on an IBM. Global economic and social statistics are his daily bread.

Cashton joined the United Nations back in 1962 as a senior statistician. He is now an assistant director in charge of New York Computing Services, the group that provides computer systems and services to some 35 user offices throughout the organization, including Unicef, the U.N. Development Program and the World Hunger Organization.

Cashton

His department specializes in applications that track world population, national economies around the globe, international health and hunger — "everything from soup to nuts," Cashton said.

"I've seen data processing grow from using an outside service bureau, spending $10,000 a year for statistical processing, to what we have today, which is not an extremely large shop but a good-size shop serving a multitude of users," he explained.

"We have 85 people here that handle programming, analysis, development work and data entry for the United Nations. We use two computers, an IBM 3081 and an IBM 4381 with [40G] bytes of disk storage, and we have about 300 terminals hooked onto our systems," Cashton said.

But the magnitude of DP operations at the U.N. cannot really be measured in taking inventory of the equipment or by looking at Cashton's $5.5 million annual DP budget. The work done by the DP department here is far-reaching, serving users all over the world. Each word processing application, for instance, is custom-made because every U.N. report must be available in several languages (see story page 11).

"We've had multiple language capability on the mainframe since day one," he said. "What we did is, we got together with IBM and designed a train for the printers that contains the capability to print each line in combinations of English, French, Spanish and Russian. So the word processing capability that we now have got its start in the data processing department."

The scope of the organization also includes communications linkages with United Nations offices in Geneva and Baghdad [Iraq]. "We hope in the near future to link up Vienna and Bangkok [Thailand]," Cashton added.

One of Cashton's more recent responsibilities has been to set policies for the selection of the personal computers and related software, "which has been slowly making its way into the U.N," he said.

Primary applications

He reported that personal computers were primarily requested by managers for spreadsheet applications, word processing and management information tools. He expects to have about 50 microcomputers in-house by the end of this year and around 200 by the same time next year.

Cashton said his biggest challenge for 1985 is "meeting the needs of the users — which are constantly growing — with the flat budget that's available to us.

"We are continually involved trying to ensure that we give the users adequate response with adequate facilities for their needs," he explained. "It becomes extremely difficult after a while."

Micros would compound problems

Asked if he thought the influx of personal computers would relieve some of the demands placed on him by end users, Cashton — a self-proclaimed personal computer advocate — said personal computers would only compound his problems.

"The [personal computer] used in an industrial complex such as this is not usually a device that is used in a stand-alone fashion," he maintained. "In most instances, the people are using subsets of data that is available on the host computers. They're really just an adjunct to the large computer.

"I think they're great, but I don't think we have reached the point where we know how to use them effectively," he concluded.

> *'We are continually involved [with a flat budget] trying to ensure that we give the users adequate response with adequate facilities for their needs. It becomes extremely difficult after a while.'*
>
> — Sydney Cashton, assistant director, New York Computing Services

Office management strategies on bill at annual AMS conference

PHILADELPHIA — A business film festival, symposiums on high technology and advanced management and a special panel titled "Managing the Office of 1990 and Beyond" will headline the 66th annual Administrative Management Society (AMS) International Conference June 16-19 at the Wyndham Plaza Hotel here. The conference also will feature a computer and office show June 17-19 at the Franklin Plaza Exhibition Hall.

Discounts of $25 are available for registrations before April 1. Discounted nonmember prices are $425, including five meals, or $305 without meals. Discounted member prices are $395 with meals or $275 without meals. Single-day registrations are also available.

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U.N.'s OA veteran saves her ammo for big problems

Structured approach to change allows focus on what's 'new or going wrong'

By Susan Blakeney
CW Staff

NEW YORK — She moved from data processing into office automation instead of vice versa. She was an office automation manager before the term existed. Her biggest success is that everything she has implemented is doing what it is supposed to be doing.

This was how Carole Thompson described her career to *Computerworld* during a recent interview here. Thompson is the Coordinator of Technological Innovations in the Department of Conference Services (DCS) at the United Nations and has seen a hefty amount of innovation during her 19-year tenure with the U.N.

In the late 1970s, Thompson was selected from the U.N.'s data processing department to introduce Wang Laboratories, Inc.'s word processing system to the DCS. The DCS is a 1,700-member body that handles all meeting-related work at the U.N.

Thompson noted, "It's the largest department in the U.N. We handle the scheduling of meetings, interpreting, translations and reporting. We print and reproduce in six languages [English, French, Spanish, Chinese, Russian and Arabic] about 60,000 documents a year."

Automating the department was no small task, and was further complicated by a fairly hostile user community that stalled the implementation of the project for more than a year. Eye strain, radiation and backaches were the cries from the would-be users. Thompson's DP background did not fail her, and she assembled a management committee and staff representatives to tackle the issues with which she was so familiar. After a long tug-of-war, the equipment came in.

"Ironically, we became known as the department that set the standards. People always call us for our guidelines. We've got a regular ophthalmologist; we let the people design their own work spaces; we've got some of the best ergonomic chairs around," Thompson said.

Her philosophy on introducing change is simple. Unlike plopping a typewriter on someone's desk, bringing in office automation requires a definite structure, she said.

> *'In a world where there are no standards, keeping up with changing technology — the unknown — is the most difficult thing.'* — Carole Thompson, U.N.

"It's best if you concentrate on building a strong infrastructure so people won't be totally dependent on you. Each time you implement a system you have to pick a technical specialist — someone to act as systems expert and supervisor to train people and maintain the system. You have to off-load the day-to-day technical responsibilities as soon as possible.

"This way, I can keep my department small and lean, which is what I prefer," she added. "I only want to hear about things that are new or going wrong. This can only happen once you get rid of the day-to-day stuff."

Thompson has derived a great deal of satisfaction from knowing that people are comfortable and relaxed at work, and "they're not going home exhausted," as they had been before the automation.

She made a sports analogy about one of her biggest ongoing challenges: "You're shooting at a moving target. In a world where there are no standards, keeping up with changing technology — keeping up with the unknown — is the most difficult thing.

"You're essentially forced to decide what to order for a given application before all the facts are in. You have to plan far enough in advance to construct your budget accordingly. In a sense, you're forced to budget only knowing half the story."

To date, Thompson has automated the English, French and Spanish groups at the U.N.; the Arabic group will be on-line during 1985, and the Russian and Chinese groups will soon follow.

She said she is happy with the way things are going and "delighted at the fact that it all works."

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Get the graphics picture in March Special Report

What do users want from graphics systems and software, and how can DP managers best meet their needs? Find some answers in *Computerworld's* March Special Report on graphics systems.

The Special Report will focus on mainframe and microcomputer graphics and the blurring line between the two. It will examine computer-aided design for microcomputers and easy-to-use graphics for mainframe systems. The report will feature both stand-alone and integrated applications and will discuss emerging graphics standards.

Contributions to the Special Report should take one of two forms: either a tutorial article discussing issues or trends or an application story outlining a particular user firm's experience.

Articles may range from four to six typed, double-spaced pages. Artwork, such as charts, graphs and photographs, is also welcome.

Authors should include a brief biography and a telephone number at which they can be reached.

The submission deadline for the March Special Report is Jan. 25.

If you have a story you would like to tell, an issue to speak on or any questions to ask, contact Janet Fiderio, Special Reports Editor, *Computerworld,* Box 880, 375 Cochituate Road, Framingham, Mass. 01701.

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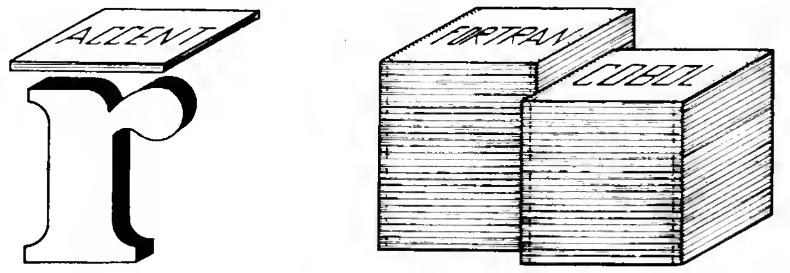

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Geisco repositions as telecommunications carrier

Firm to market Softran-based interface, file transfer, connector, communications software

By Bryan Wilkins
CW Washington Bureau

ROCKVILLE, Md. — General Electric Information Services Co. (Geisco) recently announced plans to reposition itself from a remote computer services company to an enhanced telecommunications provider offering electronic software distribution.

Geisco, a subsidiary of General Electric Co., said it will offer users electronic software distribution through its network warehouse software supplies and distribute — in conjunction with Bonneville Telecommunications Corp. of Salt Lake City — products to multiple points via the unused portion of FM radio waves. The firm has also released four software packages for the micro-mainframe environment.

Geisco said it has spent $80 million to develop its enhanced product line, which will be commercially available by the end of 1985, according to Bob McCalley, general manager of enhanced telecommunications operations.

The electronic software distribution service through Geisco's Mark III network is aimed at the 1,000 to 3,000 users who make up the Fortune 1,000 market, McCalley said. "The whole intent [of our repositioning] is to move information from intelligent providers," he added.

The areas of emphasis for Geisco, McCalley said, were value added, intelligent networking, office communications, micro integration with mainframes, professional services, electronic data interchange and remote computing.

McCalley said the company, which recently added GE's Intelligent Communications Services division as part of its business, has been beta testing the new software distribution products for one year outside and inside the company.

The major products announced by Geisco were based around its Softran Services, an electronic software management and distribution system. Users will be able to electronically distribute their own proprietary software programs, data files, test messages or spreadsheet templates. Additionally, Geisco also said it intends to be a retail distributor of commercially available software packages for micros and mainframes.

Softran is priced at $100 per package, plus there is a charge for each transaction — typically $6 to $24 per electronic download.

Softran is composed of two elements: an administrator module on Geisco's Mark III service and an end-user module for each micro. The administrator maintains a library of software for browsing and selection. The administrator can permit or deny end-user access to software and track usage for audit control.

Micro-mainframe packages

Four micro-mainframe software packages associated with Softran released by Geisco were:

- ■ The Systems Interface, which provides enhanced interactive communications between micros and public network services such as Compuserve, The Source, Dow Jones and Mark III services. It is priced at $50.
- ■ A File Transfer Utility, allowing rapid, error-free transmission of binary and Ascii data between micros and Mark III services over asynchronous communications lines. It is priced at $100.
- ■ The Connector, which provides error-free data exchanges between micro spreadsheet packages and data files residing on Mark III service in an automatic reformatting conversion. It is priced at $100.
- ■ Mark III Professional Workstation, a full screen micro-mainframe communications software package with flow control, full screen editing, print spooling and file transfer. Available electronically and by diskette, it is priced at $100.

Geisco also announced an agreement with Bonneville that will permit point-to-point and point-to-multipoint communications using satellite feeds to FM radio stations, which then transmit data over the FM subcarrier frequency to users who can receive information with addressable devices.

Bonneville has current contracts with 50 FM radio stations in 50 U.S. cities, according to President Kenneth J. Bentley. Two-way communications with a data provider and the end user via the FM satellite is made through the Geisco network.

Bentley said the service currently in operation can be used by grocery and other retail chain stores to transmit pricing changes, advertising promotions and other announcements, as well as stock and commodity price changes.

The end-user receiver/demodulator that translates the FM feed into an RS-232 communications port on a micro is manufactured by Bonneville and costs $610.

Finally, Geisco said it would also provide Quik-Ware, an electronic software warehouse users may browse through at $10/hr in search of software packages.

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Realia COBOL is priced at $995, including one year of maintenance and upgrades. Subsequent maintenance and upgrade contracts are currently priced at $125/year/copy. Available for the IBM PC, PC XT, 3270 PC, PC AT, PC-compatibles, and the TANDY 2000.

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DP forecasters often still in dark despite CPE tools

Conferees cite impact of fourth-generation languages, capacity shortages as concerns

By Kathleen Burton
CW West Coast Bureau

SAN FRANCISCO — Though sophisticated computer performance evaluation (CPE) tools are flooding the market today, forecasting future computing needs is still a hit-or-miss proposition for many DP professionals.

So said a group of CPE analysts and end users surveyed at the recent International Conference on the Management and Performance Evaluation of Computer Systems here.

In addition, several users voiced concerns over the assimilation of personal computers into the DP environment, the impact of fourth-generation languages, the lack of integration between systems and the recent increase in capacity shortages due to improper planning by users.

CPE tools flooding the market

Bert Palamaro, manager of computer performance evaluations at Crum & Forster Insurance, Inc. of Morristown, N.J., said that even with the sophisticated CPE tools that are flooding the market today, DP managers still tend to underestimate future capacity resource needs consistently because of poor forecasting, changing specifications and pilot samples that are too small.

Palamaro also said the most promising new CPE tools are those for measuring and forecasting networking performance and for transferring networked data to mainframes for analysis and integration.

According to Palamaro, the most important criterion a data processing manager should use to judge these new CPE tools is, "will they help our department meet the service levels that have been set?" The object of CPE tools is to allow installations to maximize the returns on their hardware and software investments, he said.

Dr. Hubert Engelbert, assistant vice-president at Irving Trust Co., a financial management firm based in New York, claimed that exceptional new CPE products have recently emerged for evaluating network performance and for Dasd management.

Users may face capacity shortages

Despite these product improvements, however, Engelbert said that many users will underestimate the impact of new applications on capacity and performance and will face severe capacity shortages over the next several years as a result. "Commonly, new applications have a much more demanding impact on systems than was originally planned for," he warned.

Lionel Silva, a data processing capacity planner at Amdahl Corp. in Sunnyvale, Calif., said that some CPE tools, such as a recently released MVS real-time analyzer presently being manufactured by several vendors, are "breaking new ground in the industry."

According to Silva, personal computers will play an increasingly important role in CPE capacity planning. "Attitudes have changed, and now corporations see personal computers as an asset to be managed, not just as an unintegrated orphan child," he said. However, Silva cautioned, users do not always know if a microcomputer will add to or subtract from a system's capacity, a problem that often results in severe capacity shortages for unsophisticated users.

Problems of inadequate capacity are also due to the increasing use of fourth-generation software languages, which, he said, require a great deal more processing than lower level languages.

George Simon, an analyst for the Teleprocessing and Technical Services Division of the Prudential Insurance Co. in Fort Washington, Pa., said that CPE tools have not been able to keep up with the pace of change in hardware technology, with the result that lack of integration between systems is the major problem facing the data processing world today.

According to Simon, another critical problem in the industry is that, because of their widely divergent needs, users and capacity planners speak different languages. As a result, he said, users and operational CPE planners are often at loggerheads on critical CPE issues.

> *'DP managers still tend to underestimate future capacity resources consistently because of poor forecasting, changing specifications and pilot samples that are too small.'*
>
> —Bert Palermo, manager of Computer Performance Evaluations at Crum & Forster Insurance, Inc.

Report on user satisfaction with WP systems released

DELRAN, N.J. — Datapro Research Corp. has released a report on user satisfaction with word processing systems.

The report was based on the firm's seventh annual survey of more than 27,000 users of word processing systems, in which 3,400 responses were tabulated.

According to Datapro, users rated their equipment against 10 criteria concerned with systems operation and reliability, peripheral reliability, responsiveness and effectiveness of service, technical support, actual performance compared to anticipated performance and overall satisfaction.

The study found that manufacturing companies reported the greatest usage of word processing systems, with government and educational institutions, banking and financial organizations and insurance and legal firms continuing as major users. The study also revealed that purchase is the most popular means of acquisition.

Datapro said the highest ranked systems were NBI, Inc.'s Oasys 3000, Oasys 8 and Oasys 64, followed by the CPT Corp. 8500 Series and 8000/8100, the Compucorp Omega 60 and the Exxon Office Systems Co. Exxon 500.

The report, rating 63 word processing systems, costs $29 and is available from Datapro, which is located at 1805 Underwood Blvd., Delran, N.J. 08075.

Speech Tech '85 show to focus on voice I/O applications

NEW YORK — The Speech Tech '85 Voice I/O Applications Show, sponsored by Media Dimensions, Inc., is scheduled April 22-24 at the Vista International Hotel here.

Attendees will be able to discuss voice I/O applications for telecommunications, defense electronics, robotics, medical instrumentation and quality control and as aids to handicapped workers .

The scheduled keynote speaker is Michiyuki Uenohara, executive vice-president of R&D at NEC Information Systems, Inc. in Japan. Other speakers include Richard Wiggins from the computer science department at the University of Texas; Janet Baker, president of Dragon Systems, Inc.; and Edward Neuberg, research manager at the National Security Agency.

The conference will feature field trips to facilities using voice devices, a tutorial for potential users and vendor exhibits.

The registration fee is $195 for three days and $75 for one day.

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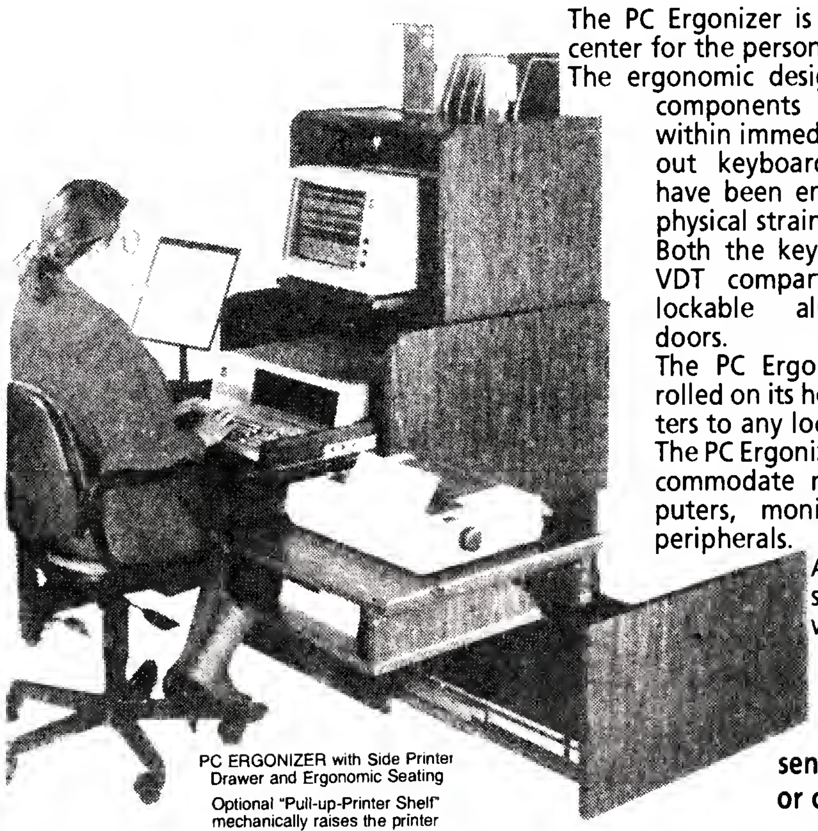

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WASHINGTON UPDATE
Mitch Betts
CW Washington Correspondent

Tax reform proposal may deter start-ups

WASHINGTON, D.C. — Officials from the American Electronics Association (AEA), at a recent press briefing, expressed concern that one provision of the Treasury Department's proposal for tax reform could choke off the venture capital needed by high-risk computer start-up firms.

William G. Moore Jr., newly elected AEA chairman and president of Recognition Equipment, Inc. of Dallas, told reporters he had sent a telegram to President Reagan commending the Treasury plan in general but strongly opposing termination of the capital gains tax preference section for high-risk investments [CW, Dec. 10].

Moore said the lower capital gains tax rate, in effect since 1978, has stimulated growth in the electronics industry and created new jobs.

Loss of the tax preference would sharply reduce the ability of small, start-up firms to get investment capital and weaken the industry's competitive position in world trade, he said.

The AEA supports Treasury proposals to lower the industry's effective tax rate and revive the 25% tax credit for research and development. Moore said these benefits would help the large, established firms but added that the small start-up firms would be harmed by the capital gains tax hike.

President Reagan vetoes NBS robotics program

WASHINGTON, D.C. — President Reagan recently vetoed legislation that would have created a $250 million federal research program at the National Bureau of Standards (NBS) to foster robotics and other automated manufacturing techniques.

Congress had approved the legislation (H.R. 5172) earlier this year as part of the NBS budget authorization for fiscal 1985, with support from the Robotic Industries Association [CW, Oct. 22].

In a statement detailing his objections to the bill, Reagan said that the variety of research, development and education programs would cost $250 million during fiscal years 1985-1988 and would "represent an unwarranted role for the federal government."

Reagan said, "Decisions on how to allocate investments for research on manufacturing technologies are best left to American industry." Furthermore, he said the proposed programs "could also serve as the basis for a federal industrial policy to influence our nation's technological development," an approach strongly opposed by the administration.

Commission supports Cabinet department

WASHINGTON, D.C. — The President's Commission on Industrial Competitiveness will recommend creation of a Cabinet-level Department of Science and Technology and a permanent federal tax credit for R&D expenditures, a commission spokeswoman confirmed recently. The panel held its final meeting Dec. 7.

The spokeswoman said the new Cabinet department is needed to "transform the current, fragmented formulation of policies for science and technology into one that would be far more effective in meeting long-term goals." Further explanation of the proposal is expected when the commission releases its final report in January or February.

The commission, chaired by John A. Young, president of Hewlett-Packard Co., was created by President Reagan on June 28, 1983. Its charter was to "review means of increasing the long-term competitiveness of United States industries at home and abroad, with particular emphasis on high technology and provide appropriate advice to the president through the Cabinet Council on Commerce and Trade and the Department of Commerce."

Infomart site of Uniforum '85 conference

DALLAS — Uniforum '85, the International Conference of Unix Users, will be sponsored by Usr/Group at Infomart here Jan. 21-25.

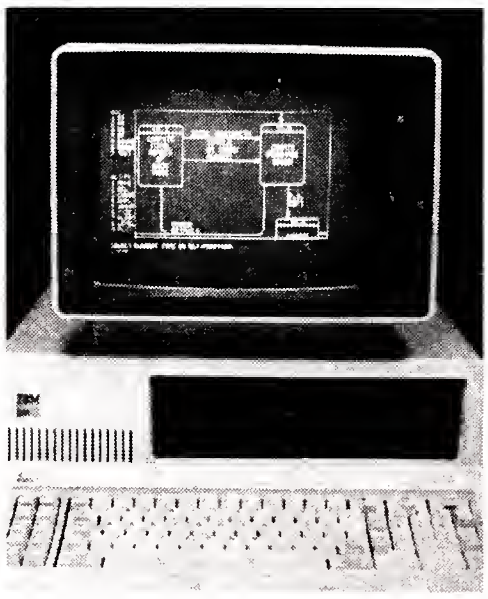
Fourteen all-day tutorial sessions will be held Monday, Jan. 21, and conference sessions are scheduled in four tracks: office systems, personal computers, engineering/programming and market trends.

Vendors of AT&T's Unix hardware, software and services will exhibit their products at the international event.

Registration prices are as follows: for the show only, there is no fee if preregistered, and registration is $10 on-site; for the tutorials, there is a $100 fee if preregistered and it costs $150 on-site; and the price for the conference is $125 in advance and $175 on-site.

Special conference rates apply for members and students.

More information is available from Uniforum, which is located at Suite 205, 2400 E. Devon Ave., Des Plaines, Ill. 60018.



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William Moore

The American Electronics Association (AEA) is composed of 2,700 member companies. The members represent various aspects of the electronics industry, including manufacturers and suppliers of computer systems and peripherals, semiconductors and other components. The organization claims that 75% of its membership is small companies employing fewer than 250 people.

Recently, Computerworld *Senior Editor/Systems Tom Henkel interviewed the newly named chairman of the organization, William Moore. Moore, who is also president of Dallas-based Recognition Equipment, Inc., began the one-year term as AEA chairman Nov. 30. For the past two years, Moore has served as a member of the AEA's executive committee, and he has been a director of the organization for the past four years.*

Q ***The AEA has been warning that the U.S. might lose its competitive edge in the world electronics market. So far, those predictions have not come true. Has the AEA changed its position?***

The relative position of the U.S. in the electronics industry is still of concern to us. One area where the U.S. will probably lose its edge this year is as an exporter of electronic equipment. We had a positive balance of trade last year, but marginally so. It looks like we are going to have a negative balance of trade in electronics this year.

There are a lot of reasons for this. One is the strength of the dollar, which affects our ability to sell products overseas. Another reason is the cost of capital, or the cost we have to pay vis-a-vis our Japanese competitors in getting capital for our businesses. The AEA continues to focus its lobbying activities in those areas. We'd also like to see the dollar become a reasonable standard for international trade without being an inflated dollar.

Q ***What about the trend of more companies manufacturing overseas?***

I think you are always going to see that. There are a lot of incentives — not only access to foreign markets but also tax incentives for high-tech companies to go overseas. But you have to put that into context. The manufacturing side of the high-tech business this year became the largest manufacturing sector in the U.S., with 2.3 million jobs and a $50 billion payroll. That is like four steel industries. The industry has been growing, and there have been a lot of new jobs created. If we continue at this growth rate, we will continue to create a lot of U.S.-based jobs.

Q ***Many start-up companies develop products that are closely patterned after successful products. For example, there was a flood of compatible products after IBM unveiled its Personal Computer. Currently, many companies are announcing workstations based on Motorola, Inc. 68000 series microprocessors. How do you feel about these look-alike products?***

I have more of a personal opinion than an AEA opinion. Basically, what you are talking about is the free market action in the entrepreneurial part of the computer business.

Take, for example, the problems that the floppy disk companies are having. It was very easy for someone to get a bunch of technicians together, put them in a garage, go out and get $2 million in venture capital and develop a floppy disk. But the market simply would not support that many products. So the people with the more marginal products are falling by the wayside.

You could argue the venture capitalists were excessive in financing all these companies. But in the net venture capital market between August 1982 and August 1983, almost anything they floated would sell. We had some excesses, and we're paying a price for those excesses now.

> *'A lot of these vendors [of look-alike products] are very resilient. If they try once and don't make it, a lot of them go back and try again.'*

Q ***How do you view the long-term impact of look-alike products on U.S. vendors' ability to develop innovative products?***

It probably leads to a fair amount of conservatism from a user's point of view. Once he's been burned once or twice by this phenomenon, he probably favors the major vendors, such as the standardization around IBM or IBM-compatible products.

But does it limit innovation? I don't think so. I think what you really end up with is the survival of the fittest. In fact, a lot of these vendors are very resilient. If they try once and don't make it, a lot of them go back and try again.

Q ***But if many small companies possess that resilience, what does that mean to users? For example, what is the user of a 68000-based workstation to do if two years from now the supplier is developing Lisp machines or Ada machines?***

Over time, the market is much less responsive to the entrepreneur for that reason.

> *'The Japanese will dominate [the optical disk area] because it will be a commodity product supplied to various vendors.'*

Q ***One advantage to look-alike products is that they are typically developed with inexpensive off-the-shelf components. That has led some industry observers to believe computer systems are becoming a commodity. Do you feel this is a trend? What future impact to you feel it will have on the electronics industry?***

It has become fairly clear over the past few years that the Japanese are extremely competitive when it comes to commodity products. We have seen them dominate in the random-access-memory development area. We are also beginning to see the same thing in the optical disk area; the Japanese will dominate because it will be a commodity product supplied to various vendors for personal computers, home entertainment and big systems.

But when you get into the systems side, although you may use commodity products to piece together your system, it is clearly the systems software, the operating system and the overall performance characteristics of the system itself that are most important. And I think that is where the U.S. will be preeminent, both as a manufacturer and exporter. You just have to understand that it is very difficult for us, given our short-term profit orientation, to be consistently cost-competitive in investing the amount of development funds you need to have these first-rate commodity products.

Q ***The term "industry standard" is applied to many products in the electronics business. How do you feel about standards developed by recognized standards organizations such as the International Standards Organization and the American National Standards Institute?***

The best thing that has happened to the computer business, in my opinion, has been the proliferation of the personal computer. Because now you have people like you and me trying to plug a printer into a printer interface, trying to initialize a disk and trying to load a very fundamental piece of

See **MOORE** page 16

Firm to launch satellite-based micro teletext system

By John Dix
CW Staff

NEW YORK — A two-year-old company here is readying an information distribution system that will marry satellite and teletext technology to enable information providers to disseminate data to personal computer users.

Satellite Network Delivery Corp., which was founded with seed money from the Tribune Co. of Chicago and recently raised more than $2.5 million from a private placement by Cralin & Co., an investment banking and retail brokerage firm in New York, is building a teletext-based network targeted at business use.

Capacity of the company's Business Teletext Network (BTN) will be leased to information providers such as brokerage houses, investment services and publishers. These firms reportedly will use the system to distribute business information, provide quotation services for securities and commodities trading, distribute advisory services and broadcast electronic mail to personal computer users outfitted with special decoders.

A central BTN computer facility in New Jersey will accept real-time data from information providers. After formatting the data for network use, this computer will transmit the information via satellite to television studio receive-only satellite earth stations located in the top 75 markets across the country.

Data inserted in VBI

Participating television stations, many of which the company has already reached agreements with, will be outfitted with BTN-provided electronics that will insert the received data into the broadcaster's vertical blanking interval (VBI) for distribution like regular television signals. The VBI is the black line that appears between picture frames when the vertical hold on a television goes out of whack.

Information bundled into the VBI will be broadcast to and received by addressable tuner/decoders that service subscribers will attach to their personal computers. The memory and intelligence of the personal computer, coupled with the decoder's memory, will enable the user to view the information as it is being received or save the information for later use.

BTN plans to retain control of all user decoders, which will enable it to add and delete subscribers by remotely turning the decoders on and off. The identification number of each decoder will also enable BTN to address closed user groups or filter out information for delivery to specific subscribers.

When completed, the BTN network will reportedly be capable of supporting hundreds of concurrent information services. Each of these services can operate at its own speed.

Users will reportedly be able to use their personal computers and a single tuner/decoder to seize and save information — either directly or in an unattended mode — from several subscriptions, even if they are transmitted at the same time. Additionally, the decoders can be equipped with a decryption capability to lessen the likelihood of service piracy.

The company anticipates that the network will be used during business hours to distribute real-time information and that after-hours it will be used mainly to distribute larger amounts of data. A subscriber's personal computer, interfaced with a 9,600 bit/sec tuner/decoder, would enable a user to capture 5M bytes of information in an hour and a half, the company estimated.

In practice, an information provider could use this capability by downloading a large data base once every three weeks, for example, and update that information daily to keep it current, the company reported.

Although service costs are still uncertain, the firm estimated that user decoders will sell for approximately $200. Information providers network contract costs will reflect projected use. The network is scheduled to be operational by the end of next year.

MOORE from page 15

software. Suddenly, the users of computers are no longer taken in by the idea of some all-encompassing set standards that will make their lives easy.

From this point forward, other than broad standards — such as how to shake hands in a communications protocol — standards are going to become less important because the user is more sophisticated.

The reason IBM was so dominant in the 1950s and 1960s was the user didn't want to be bothered. He wanted someone to hold his hand for him. And IBM was great at that.

***Q** How do you feel about the so-called "de facto" standards that center around popular products? Are these really industry standards or simply market trends that will change in a short time?*

Standards really mean that you have second and third sources for something.

I want to know that if I choose an Intel Corp. microprocessor as the basic building block of a system, there will be three or four other sources of supply — especially if IBM buys everything Intel builds. So I want to make sure there is a standard to make that particular chip.

Then there are interconnect standards. Basically, I want to know how I get onto a network, but it is more analogous to the telephone network.

What we are really looking forward to is to allow all these computer terminals to be able to talk to each other over some common network.

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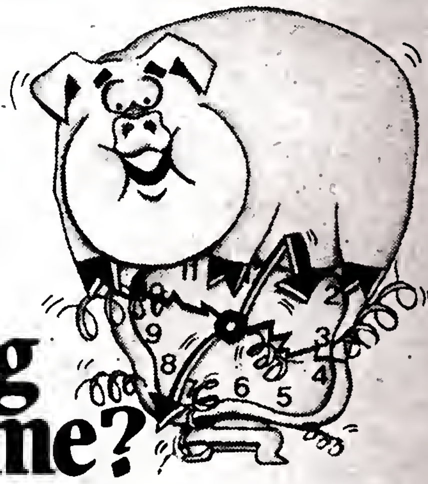

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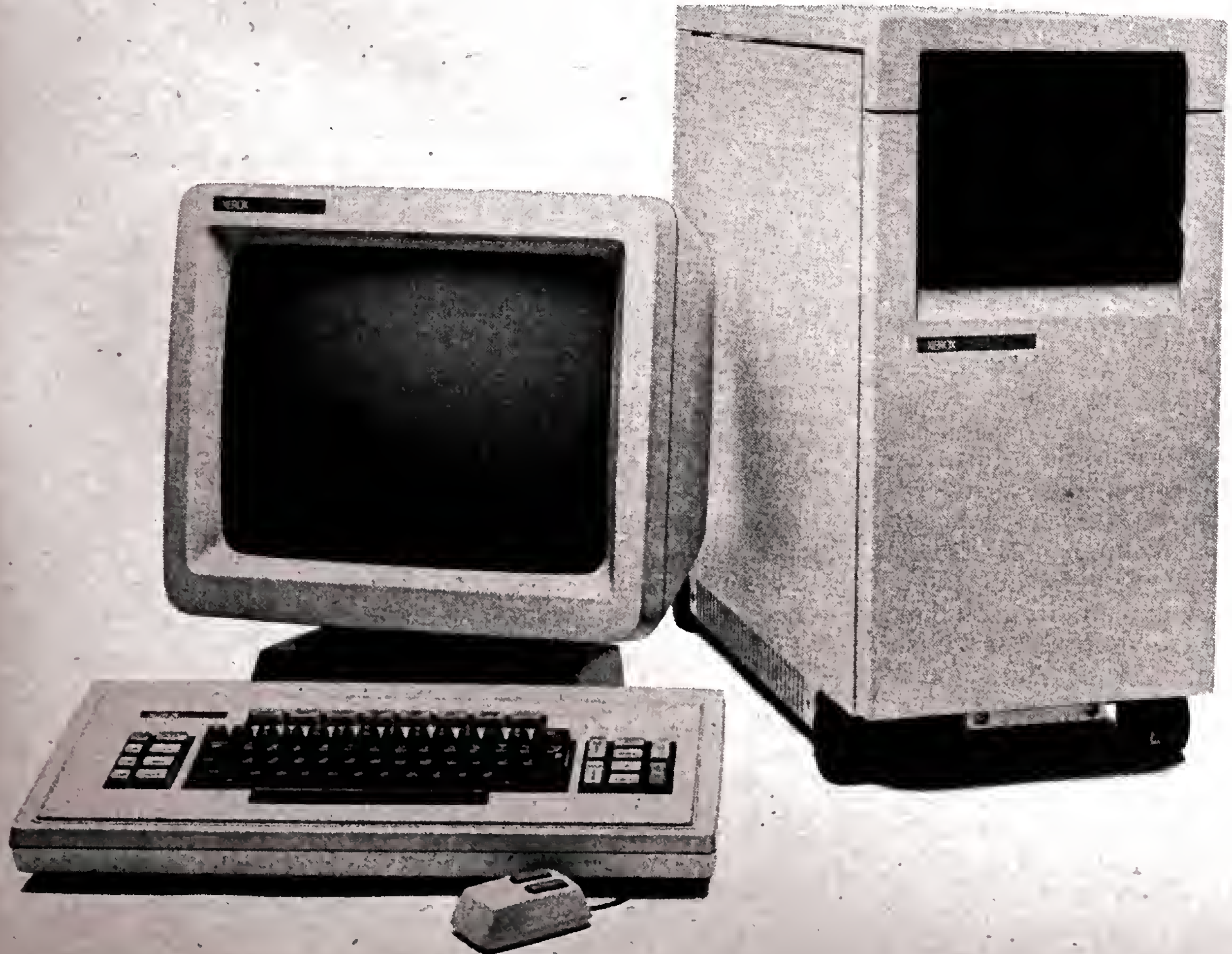

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CCDA statistics show 90% of Canada's programs illegal

Software piracy, plagiarism cost manufacturers millions of dollars, increase prices

By Laura Jo Gunter
Special to CW‡

TORONTO — Just one out of every 10 software programs in use in Canada is a legally produced program. The remaining 90% of the programs here are either pirated or plagiarized, according to statistics from the Canadian Computer Dealers Association (CCDA).

In dollars and cents, this means a considerable loss to software manufacturers, society at large and even the end user. Industry analysts in the U.S. estimate that in 1984 alone, U.S. software producers will lose $700 million in revenues to illegally copied programs.

Similar figures are not available in Canada, but the CCDA estimates that 10,000 jobs are lost annually in the software industry due to piratings. This costs the Canadian economy as much as $100 million per year.

Perhaps surprisingly, piracy also hurts the end user. Software companies must raise the price of their programs to compensate for revenues lost to pirates. Scott Brown, technical public relations director for Ashton-Tate of Culver City, Calif., admitted that this phenomenon has caused his company to increase prices for its software. The reason, he said, is that there are three to seven times as many pirated copies of the company's software circulating than there are legitimate programs.

The actual act of piracy can be as innocent as a student following the teacher's instructions to copy a disk. It can also be as irredeemable as someone being in business solely to copy the valuable results of the labors of others. With nearly no overhead, the pirate can undercut the originator by so much that the originator has little chance of competing.

Obviously, it is the latter case that worries most legitimate software producers. This kind of piracy can take one of three forms. The first type is the commercial pirate working out of a storefront, often going under the title of "software review club."

"This is the major way that pirates get around the law," maintained Bruce Hampson, president of the CCDA. "They tell the customer that he has to pay $10 for a copying charge and then he can take the program home to evaluate it. After the evaluation, the customer is on his honor to destroy the copy and buy a legitimate program, but nobody will. They [the pirates] can claim that they're charging a copying fee and not selling anything, so they're not breaking the law."

This is not to condemn all review clubs. There are legitimate clubs that loan software for review and have it returned in much the same way as a book library system.

Then there are the pirates inside corporations. In this case, the pirates are saving money by buying one program and then making several copies to be distributed among other employees.

This small network of users also fits the last type of pirate known as the "home hacker." These people copy software to sell or give to a small market, usually friends. This group is the largest in terms of the number of people involved but is the least likely to be prosecuted, Latner said, because they usually deal with less expensive software, such as game programs, in small quantities.

Because of piracy, software companies are developing sophisticated copy protection for their products. This makes it difficult, if not impossible, for a legitimate user to make a backup copy in case something happens to the original.

"It's also hard to put software onto the hard disk," claimed Glen Siegel, president of the Personal Computer Club of Toronto. "It [copy protection] makes life more difficult. If you ruin the master disk, then you're out of luck until you get a new one."

Robert Mittler, director of information services at Bristol Aerospace Ltd. in Winnipeg, Canada, said that he would not mind the hassles if it would help the software developer.

Gunter is a staff writer for Computer World Canada, *which is published by Rattray Publications Ltd. of Toronto.*

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RENO, Nev. — Users of SAS Institute, Inc.'s SAS family of products will get an opportunity to discuss new applications and discover new techniques at the 10th annual SAS Users Group International (Sugi 10) conference to be held at the MGM Grand Hotel here March 10-13.

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In addition to the sessions and a roundtable luncheon discussion, SAS/Graph users will submit their best efforts in the first SAS/Graph Competition and Exhibit. Entries will be submitted for "Best Presentation of Data" and "Most Creative Use of the Software."

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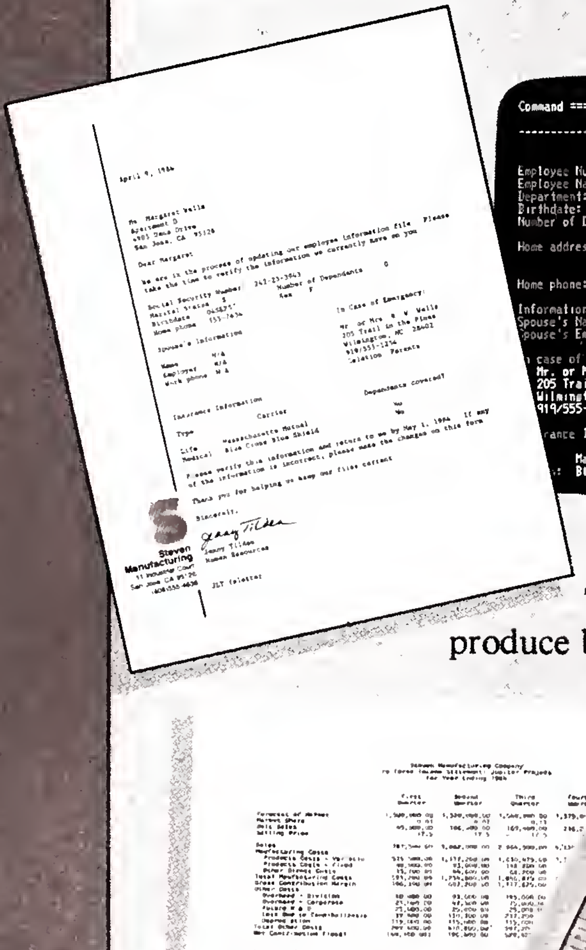

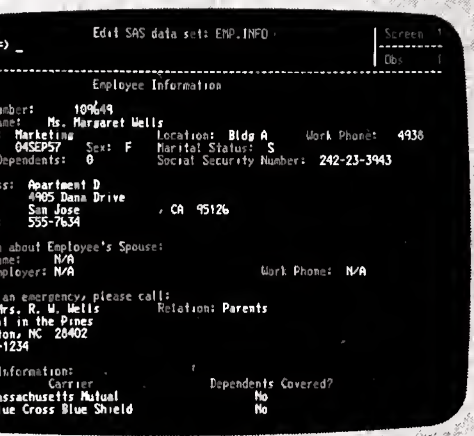

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Command ===> _                                               ---------
                                                             Obs     1
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                        Employee Information

Employee Number:      109649
Employee Name:    Ms. Margaret Wells
Department:  Marketing              Location:  Bldg A     Work Phone:   4938
Birthdate:   04SEP57    Sex:  F     Marital Status:  S
Number of Dependents:   0           Social Security Number:  242-23-3943

Home address:  Apartment D
               4905 Dana Drive
               San Jose             , CA  95126
Home phone:    555-7634

Information about Employee's Spouse:
Spouse's Name:     N/A
Spouse's Employer: N/A                             Work Phone:  N/A

 case of an emergency, please call:
  Mr. or Mrs. R. W. Wells          Relation: Parents
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                  Carrier                    Dependents Covered?
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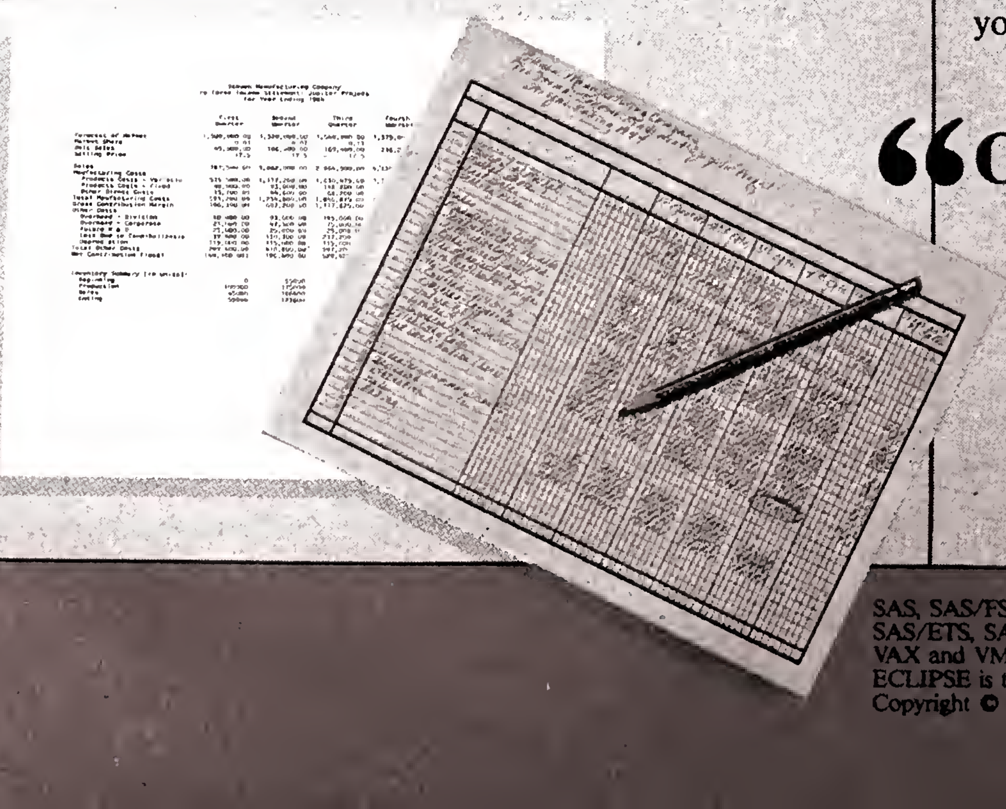

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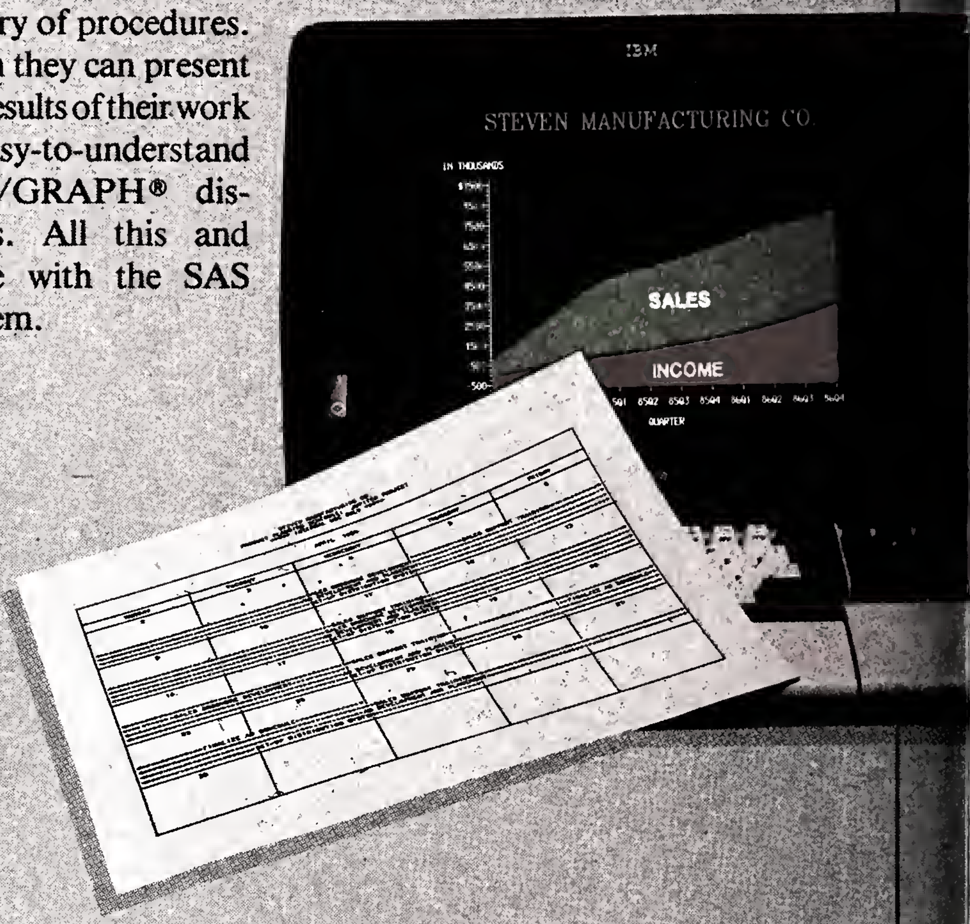

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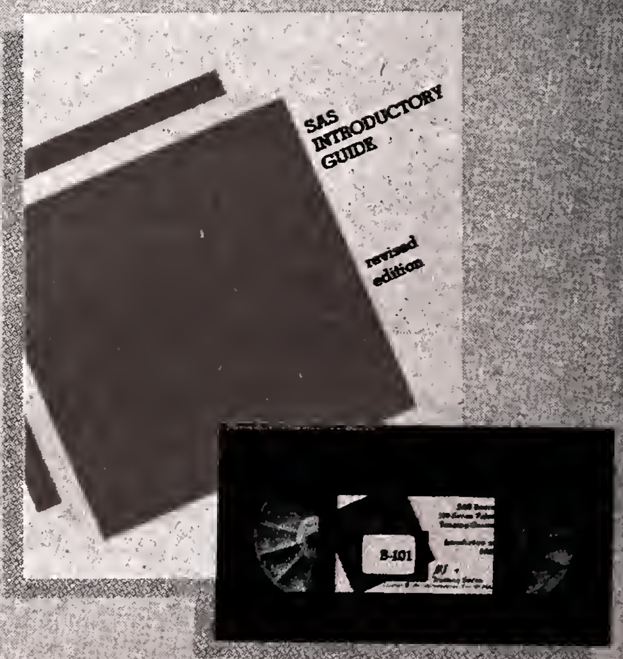

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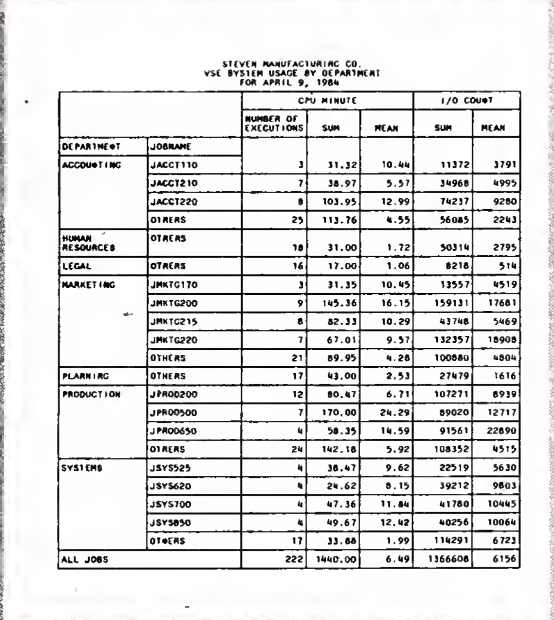

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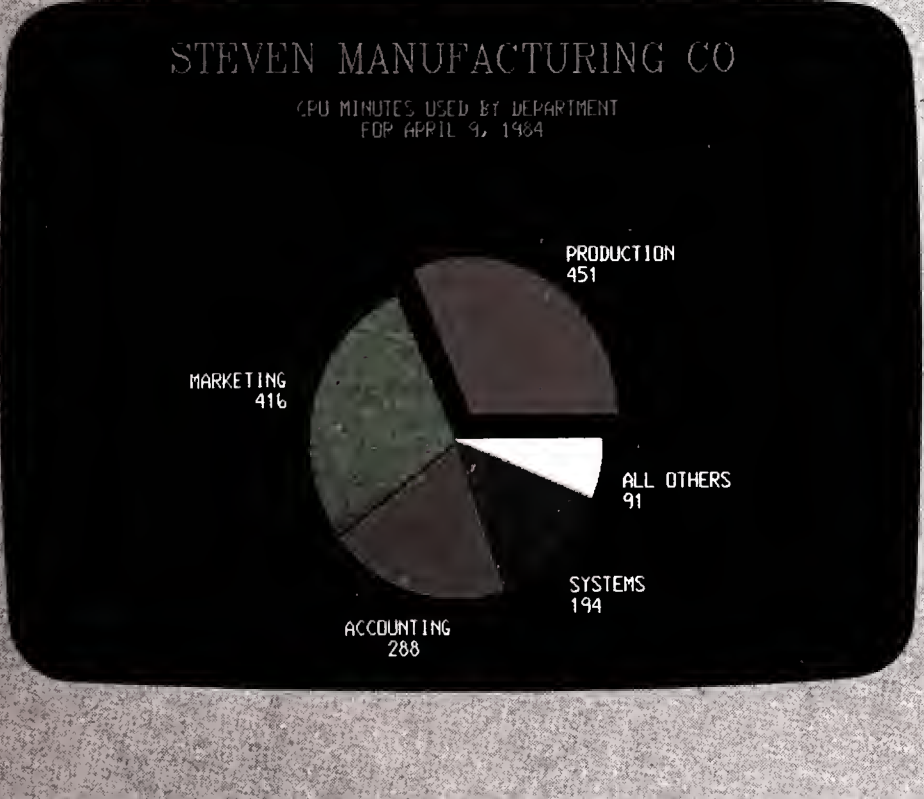
VSE SYSTEM USAGE BY DEPARTMENT
FOR APRIL 9, 1984

		CPU MINUTE			I/O COUNT	
		NUMBER OF EXECUTIONS	SUM	MEAN	SUM	MEAN
DEPARTMENT	JOBNAME					
ACCOUNTING	JACCT110	3	31.32	10.44	11372	3791
	JACCT210	7	38.97	5.57	34968	4995
	JACCT220	8	103.95	12.99	74237	9280
	OTHERS	25	113.76	4.55	56085	2243
HUMAN RESOURCES	OTHERS	18	31.00	1.72	50314	2795
LEGAL	OTHERS	16	17.00	1.06	8218	514
MARKETING	JMKTG170	3	31.35	10.45	13557	4519
	JMKTG200	9	145.36	16.15	159131	17681
	JMKTG215	8	82.33	10.29	43748	5469
	JMKTG220	7	67.01	9.57	132357	18908
	OTHERS	21	89.95	4.28	100880	4804
PLANNING	OTHERS	17	43.00	2.53	27479	1616
PRODUCTION	JPROD200	12	80.47	6.71	107271	8939
	JPROD500	7	170.00	24.29	89020	12717
	JPROD650	4	58.35	14.59	91561	22890
	OTHERS	24	142.18	5.92	108352	4515
SYSTEMS	JSYS525	4	38.47	9.62	22519	5630
	JSYS620	4	24.62	8.15	39212	9803
	JSYS700	4	47.36	11.84	41780	10445
	JSYS850	4	49.67	12.42	40256	10064
	OTHERS	17	33.88	1.99	114291	6723
ALL JOBS		222	1440.00	6.49	1366608	6156



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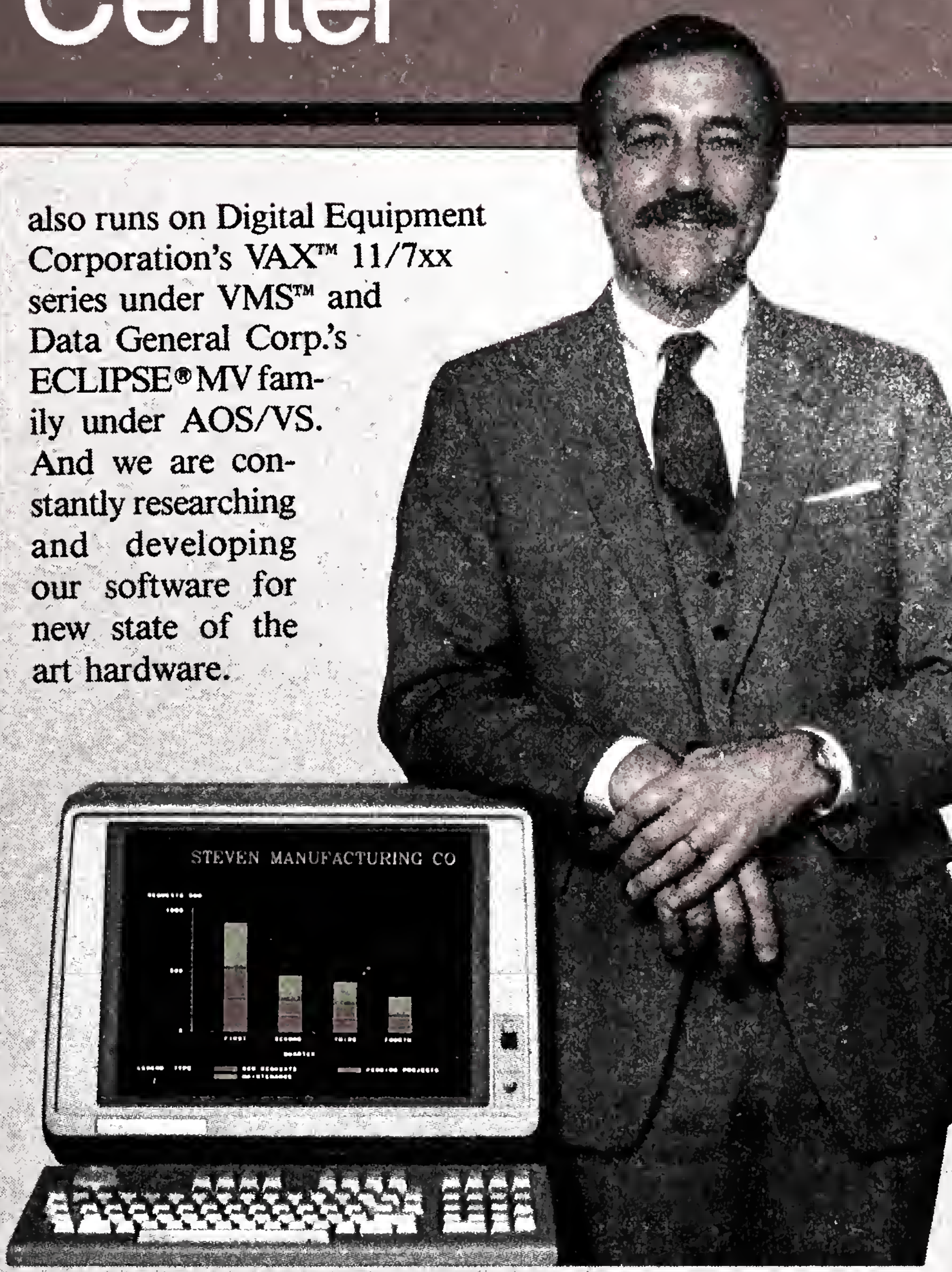

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12/17

INTERNATIONAL REPORT

CW International News Network

AUSTRALIA

SUMMER HILL — An expert system that provides quantitative measurement of the performance of software and systems will be the first project of an artificial intelligence research center to be established here next month.

The Productivity Research Center will be created by software consultant David Tow, with the backing of the Systems Research Institute of Australia in Perth. The system, called the Spacer 9 system, will reportedly provide audit and comparative evaluation and review.

BRAZIL

BRASILIA — Two policies on privacy are now under debate here in the Brazilian Congress. At issue is the recovery and use of information kept in a public data base. The latter proposal, seen as the more far-reaching of the two, is seeking to keep more information safe from potential government surveillance.

ITALY

ROME — IBM Europe President Kaspar Cassani told the European scientific press here recently that the company will award an IBM Europe Prize for the best European scientist in 1985. He also announced the establishment of a scientific engineering center here to be made available, free of charge, to 15 European engineers.

JAPAN

TOKYO — IBM Japan Ltd. has recently begun full-scale production of 5¼-in. hard-disk drives for the IBM Personal Computer XT. The drives reportedly will be available in 10M-, 15M- and 20M-byte configurations.

■

TOKYO — Densan Co. Ltd. has unveiled its Idea 2000 microcomputer, which runs on Unix 4.1 and operates at speeds up to 20M bit/sec using a local bus, the vendor said. The system is being targeted at schools, laboratories and in distributed, office automation and computer-aided design environments. Densan also announced that it will begin exporting its products on a large scale to the U.S.

■

TOKYO — Fujitsu Ltd. has announced a 16-bit personal computer, the FM-16 Bata, for business use. The machine is based on the Motorola, Inc. 80186 microprocessor and the Japanese CP/M 96 Kanji operating system. It reportedly handles Kanji character processing.

■

TOKYO — Nippon Telegraph and Telephone (NTT) has unveiled its Captan videotex service. The system currently lists 310 information providers and 1,790 terminals in use.

ENGLAND

LONDON — The UK has gained a major presence in the Chinese computer market with the establishment of a $50 million joint venture company to produce microcomputers in China. The UK consortium, headed by Rair Computer Corp., will reportedly provide the Chinese with the knowledge and equipment needed to establish their own micro industry.

■

LONDON — Embarrassing news greeted Control Data Corp. here with the revelation that the Russian PS 2000 supercomputer, recently sold to India, is based on CDC technology. The system was originally conceived as a Soviet-CDC joint project, but the U.S. government forced the American vendor to pull out of the project. The PS 2000, which is said to be in the 400 million to 600 million floating-point operations per second range, makes the USSR the third independent source of supercomputers in the world.

WEST GERMANY

MUNICH — IBM is being accused of selling its machines for low prices through the back door in order to undercut competitors here. At the same time, the German subsidiary of the Swedish lessor ICS is thought to be profiteering on IBM's 40% university discount policy by leasing discounted machines to German universities and reselling them to commercial users for full price.

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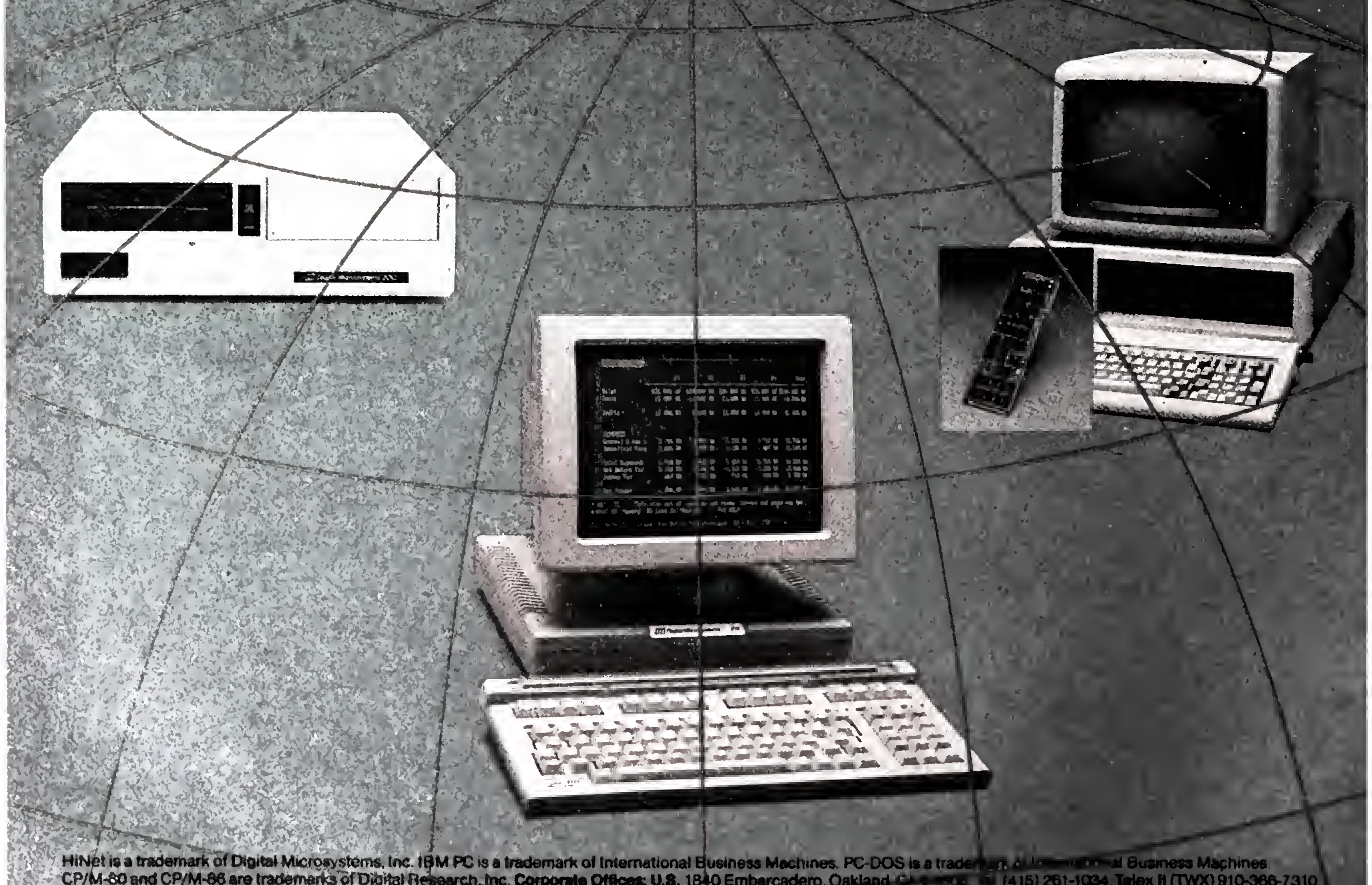

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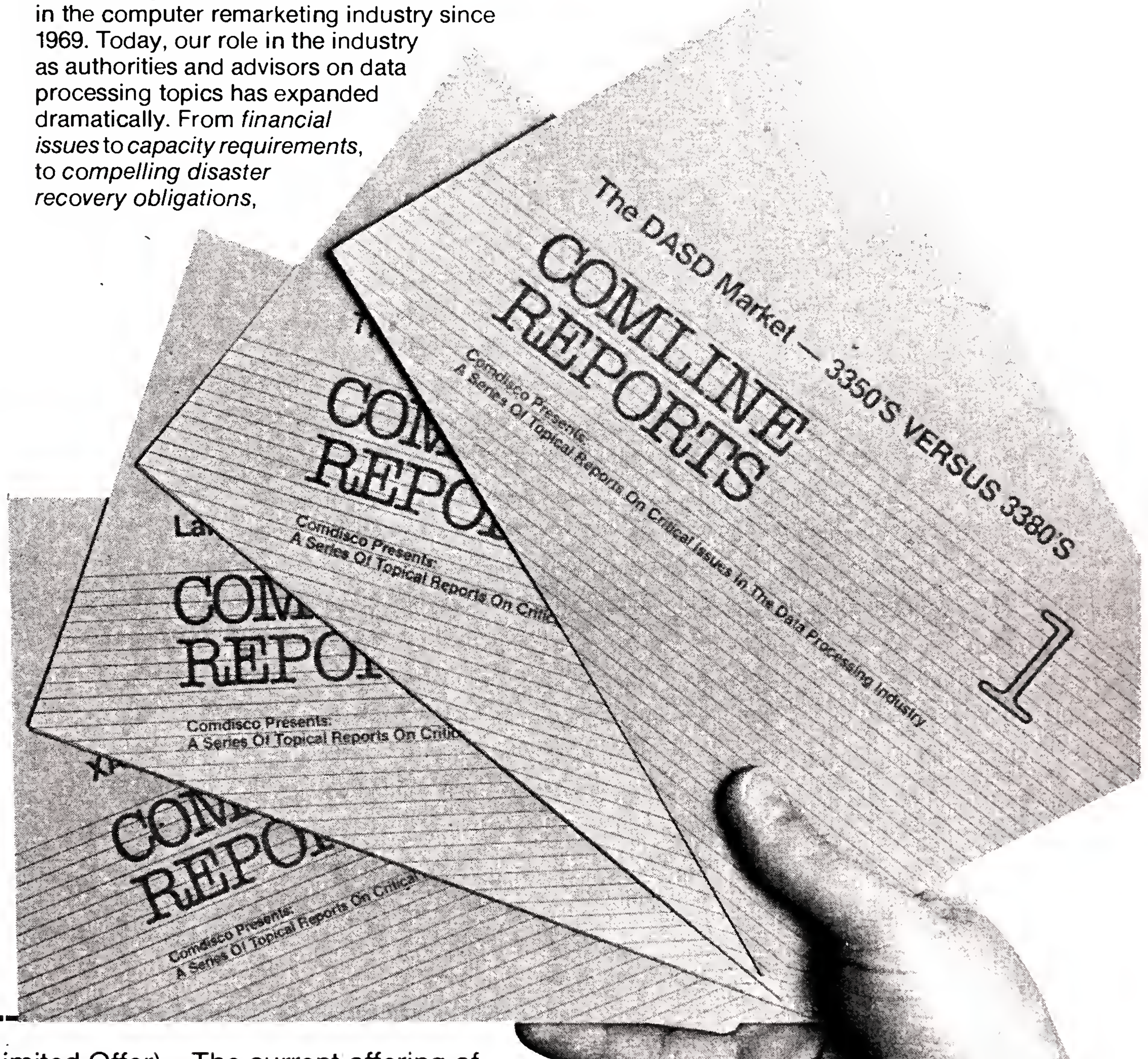
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NEWS

Computer-related training available for handicapped

By Donna Raimondi
CW Staff

STAMFORD, Conn. — Thirty of the top Fortune 500 companies are giving gifts of money, time and hope here to a group of handicapped people.

The companies are funding a program run by the Biped Corp. that trains handicapped workers to become computer programmers, according to Kathy Jarvie, instructor/coordinator at Biped. The one-year school, which is free of charge to enrollees, teaches Cobol, Basic, JCL and dump analysis to the physically handicapped and offers classes in additional subjects such as microcomputers and data bases, according to Jarvie.

The school's graduates have found jobs in a variety of businesses, she noted, and it usually costs the hiring business nothing for special equipment or accommodations.

At present, GTE Telenet Communications Corp. and Union Carbide Corp. contribute $70,000 to $80,000 worth of computer time each year, Jarvie said, and companies, including American Can Co., Xerox Corp., Reader's Digest Association, Inc., Texaco, Inc., IBM and Perkin-Elmer Corp. donate money, equipment, office supplies and anything else the school needs to do its job.

Representatives from donor companies sit on all school committees and advise the school staff on what job skills are in demand, Jarvie said, helping it to fulfill realistic business community needs.

Industry provides a better program

The program was started in 1980 by Joseph LaMain, Jarvie said. "LaMain was a programmer/analyst at the time, and he worked for the Easter Seal rehabilitation center in New Haven, Conn. He thought that industry would provide a better program, with less red tape, than any government agency could," she said.

The program now operates centers in White Plains, N. Y. and Stamford, Conn., Jarvie said. Twelve students are accepted into each program from the more than 200 who apply at each location. Each program has two teachers, she said.

The program accepts students with almost any handicap, including blind, deaf and quadriplegic people, Jarvie said, but it is not easy to get accepted. Jarvie administers IQ tests to all applicants, looks over medical reports and high school or college records. The student then sits with a psychologist for four hours and performs a number of computer aptitude and reading comprehension tests, she said.

The classes comprise a variety of age groups and education levels, Jarvie said. This year, two of the students she taught had master's degrees and two were straight out of high school, she said.

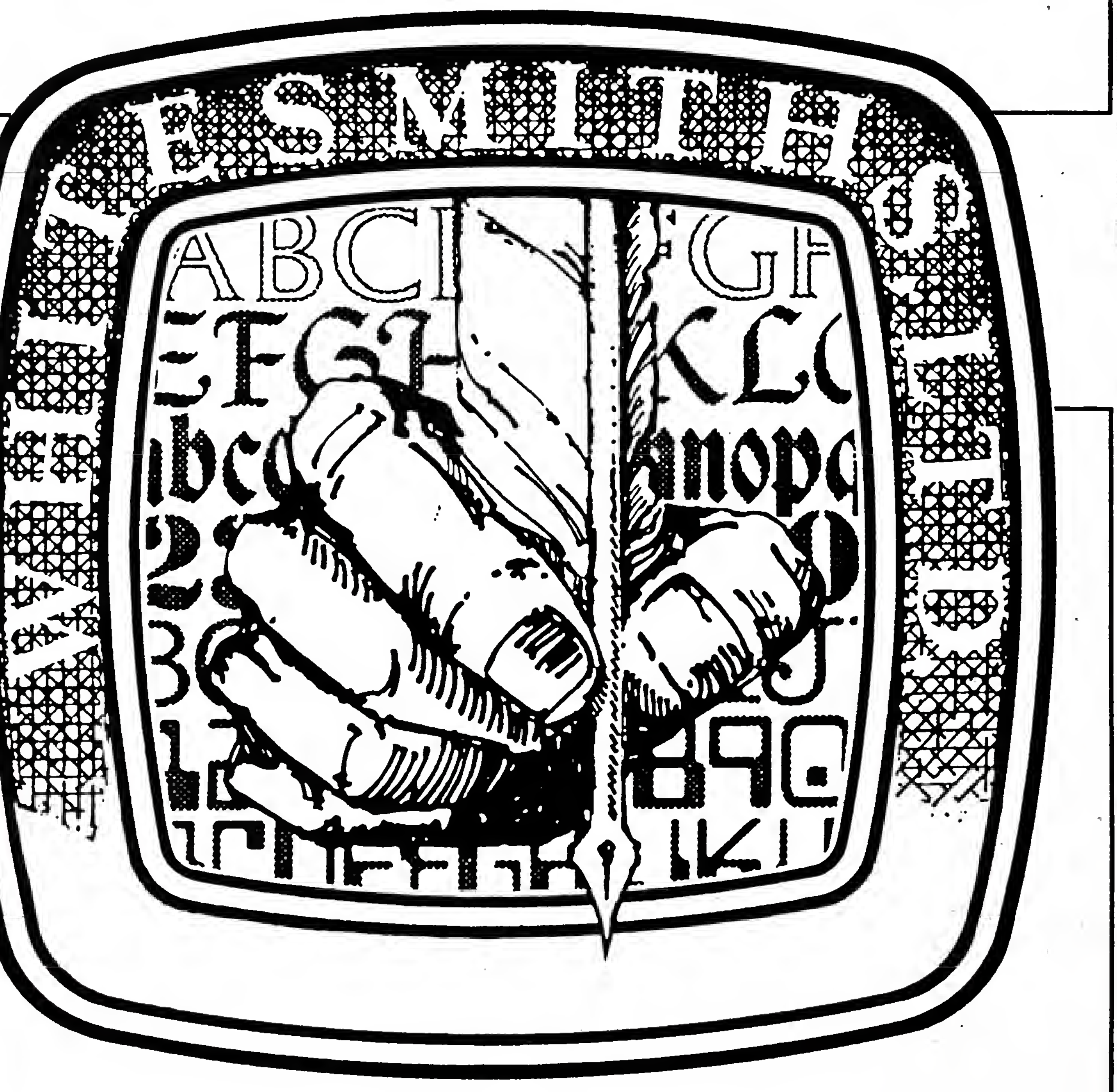
In addition to course work, the students are taught business etiquette, dressing for success and a variety of business related skills.

"We run the program like a company," Jarvie said. "We teach the students about status reports, presentation arts and other skills that the corporations tell us the students need to be ready for employment." The instructors hold students responsible for reporting equipment problems to vendors and seeing to it that repairs are made, she noted. "They basically run the company with my guidance," she added.

After completing the course, the new programmer receives a certificate and goes through a committee — made up of members of the sponsoring companies — for placement.

More information is available from Biped, 26 Palmers Hill Road, Stamford, Conn. 06902.

C Compilers



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IBM® Software Notes

News for the DP professional

BancOhio is constantly improving its products and services, with help from IBM's DB2.

Managers at BancOhio Are Banking on DB2

"DATABASE 2 (DB2) is an efficient vehicle for providing our top management with financial and analytic details," says Jack Kiger, Vice President and Director of Data Processing at BancOhio in Columbus, Ohio.

The bank, which has more than 250 branches throughout the state, has been testing DB2, IBM's full-function relational data base system, for a year and a half. "In that time, we did a 22 man-year MIS project in only 24 man-months," reports Kiger.

The key to this outstanding productivity is DB2's powerful Structured Query Language (SQL), which makes corporate data available—simply, economically and with full data security and control.

Through its Query Management Facility (QMF), DB2 provides end users with a friendly interface to SQL, including a full set of helps and prompts. Users can query the data base directly, ask the system to generate reports or create their own unplanned reports.

But DB2 is much more than an end-user product.

It's a full-function relational system that lets professional programmers develop complex applications with greatly improved productivity. It provides them with the facilities they need for backup, recovery, restart and security. These functions can be incorporated in an application by simple statements and need little explicit programming.

With these security provisions, transactions are well protected. This means that DB2 can handle online applications while maintaining the integrity of the corporate data resource. Thus DB2 can meet the full range of needs: production work as well as end-user query and reporting services.

"Our experience with DB2 has been beneficial," Kiger adds. "From the standpoint of stability and ease of use, it's the best product IBM has delivered to us." ■

A NOTE TO THE READER

To keep you informed of software developments at IBM, we will publish *Software Notes* on a regular basis.

Software Notes will bring you news of programs that help make systems and people more productive. It will feature articles on high-productivity packages such as DB2, IBM's full-function relational data base system, and application development tools such as the Cross System Product Set. And it will tell you about users' experiences with IBM software.

We'll also let you know about new software courses and other IBM offerings that can help you get the most from your DP resources.

More *Software Notes* appear on the next page.

Software Notes

Evaluator (rear) works with a piece of IBM software. Observers note her efforts and record them.

'Usability' Labs Help Make IBM Software Easy to Use

It's one thing to create software that works. It can be quite another to make that software easy for users to learn and operate, and to support it with documentation that's easy to follow.

Dr. Lewis Branscomb, IBM's chief scientist, puts it this way: "It shouldn't be necessary to read a 300-page book of instructions before using a computer, any more than it is before driving a new automobile."

That's why, prior to release, IBM evaluates many pieces of software for "usability." We've taken a scientific approach to this process in Usability Laboratories located in cities across the United States.

The evaluators are people who have not had software experience.

In each lab, we've set up a complete office environment, attractively decorated and comfortably furnished. On each desk is an IBM workstation which supports the software to be evaluated.

Here, evaluators at the workstations are handed the instruction manuals and assigned the task of putting a piece of software through its paces. As each evaluator works, he or she is observed and recorded. Every interaction on the workstation screen is recorded too.

Through this feedback we've learned a lot about our software—and our documentation. We've also made software, such as the IBM Business Management Series, a lot simpler to use. ■

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If you're interested in learning about management issues related to information systems, or in getting advice on training, or in just keeping current yourself, you'll be interested in the offerings of IBM's Information Systems Management Institute.

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The courses seek to help users increase their productivity in data processing. Lasting from two to five days, the courses are offered in over 25 cities and are taught by staff instructors who combine years of teaching with practical knowledge.

To order a free catalog of courses, just return the coupon at right. ■

The Cross System Product Set Aids Programmers at Corning

Through an innovation in application development, Corning Glass Works, Corning, New York, has eliminated most of the detail work involved in conventional programming.

The innovation is the Cross System Product Set from IBM.

With this program, a developer can complete every phase of a project interactively at a terminal. This includes defining and validating screens, files and logic; testing and debugging a program; running trial executions and putting the application into production.

The Cross System Product Set is especially effective as a development facility for applications designed to run under CICS, or in distributed 4300 and 8100 systems.

According to Steve Grace, Supervisor of Application Development Technology at Corning, "The program's interactive nature and extensive debugging aids lend themselves to developing applications quickly and accurately."

What's more, the Cross System Product Set requires fewer special CICS skills on the part of the programmer. Such features as trial screens and quick prototype executions improve communication between DP personnel and end users.

The program runs on all 4300 and 30XX series operating systems and on the IBM 8100 with DPPX/System Program. It's portable, so that an application developed on one supported system can be run on another.

Mr. Grace sums up Corning's experience with the Cross System Product Set like this: "As a result of its many benefits, we've been able to satisfy user requirements faster and more economically." ■

RACF Helps Protect Data At United Student Aid Funds

"We are pleased with the enhancements of the IBM Resource Access Control Facility (RACF)," says Dan Roddy, Manager of Data Center Support for United Student Aid Funds, Indianapolis, a nonprofit corporation which guarantees and services student loans.

"In particular, a new system of resource definition in RACF, called 'generic profile checking,' makes administration much simpler. Most data sets can be protected using only the first-level qualifier," Roddy adds.

Profile checking is just one of the many features that make RACF easy to implement and maintain. Flexibility of design and structure is another. In addition, with RACF you need not modify your operating system or system-level software such as CICS, IMS, DB2 or HSM.

RACF uses list orientation, a simple technique for access control. With little effort, you can establish ownership and control over your resources. You can also designate who else may have access—and how much access.

RACF has features which make it easy to demonstrate that the controls have worked.

Positive control, excellent security, simple maintenance and administration: These are the benefits that make RACF a widely accepted access control product. And RACF is designed to work closely with such IBM operating systems as MVS and MVS/XA. ■

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System used in protest

Students stage futile attempt to crash computer

By Donna Raimondi
CW Staff

OBERLIN, Ohio — Student activists here tried but failed to overload the campus computer system to bring attention to their demands that Oberlin College divest itself of stock in South African companies.

In response to an open plenary session of the school's board of trustees in the Mudd Learning Center — where the library and computer center are housed — a splinter group of the Student Coalition Against Apartheid decided to bring down the computers in protest of the stock holdings, said John Harvith of the school's public relations office.

"The student organization got together to determine how to protest, and the organization as a whole decided not to use computers to do it," Harvith said, but four to six students did it anyway.

"They were not sophisticated about it," said Kevin Weidenbaum, director of academic support services at the college. "It's possible that if a consultant had not come in and told me what was happening, we wouldn't even have noticed," he said.

The protesters decided to run programs that would grind on the system, Weidenbaum said, and several students sat at terminals with an old Basic assignment — a long iteration process to find sets of integers in a given equation, he said. Others did "even sillier things" he added, like setting up loops to keep the printers spewing out garbage printouts.

At the peak of the protest, the computer was running an average load, Weidenbaum said. "These are not hackers with novel and interesting ways to crash the computer," he added. Some of the student protesters had never used their accounts before, and the students did not really know what they were doing, he said.

The target computer was a 10-year-old Xerox Corp. Sigma 9 that is not used much anymore, Weidenbaum said. Students also tried to bog down the college library's automatic circulation system by checking out and returning huge numbers of books — another ploy that failed, he said.

"We deactivated a couple of student accounts because of it," he said, but no further disciplinary action will be taken.

Apple Macintosh subject of meet

WESTWOOD, Mass. — Apple Computer, Inc.'s Macintosh microcomputer will be the focus of discussion at the Feb. 21-23 Macworld Exposition at Brooks Hall in San Francisco.

Sponsored by *Macworld* magazine, the exposition reportedly will include product exhibits and conference sessions as well as a software clinic.

Cost of admission to the three-day show is $15 for exhibits only, $30 for exhibits and conference. Charge for students is $5 for exhibits only, $15 for conference and exhibits.

More information can be obtained from Mitch Hall Associates, P.O. Box 860, Westwood, Mass. 02090.

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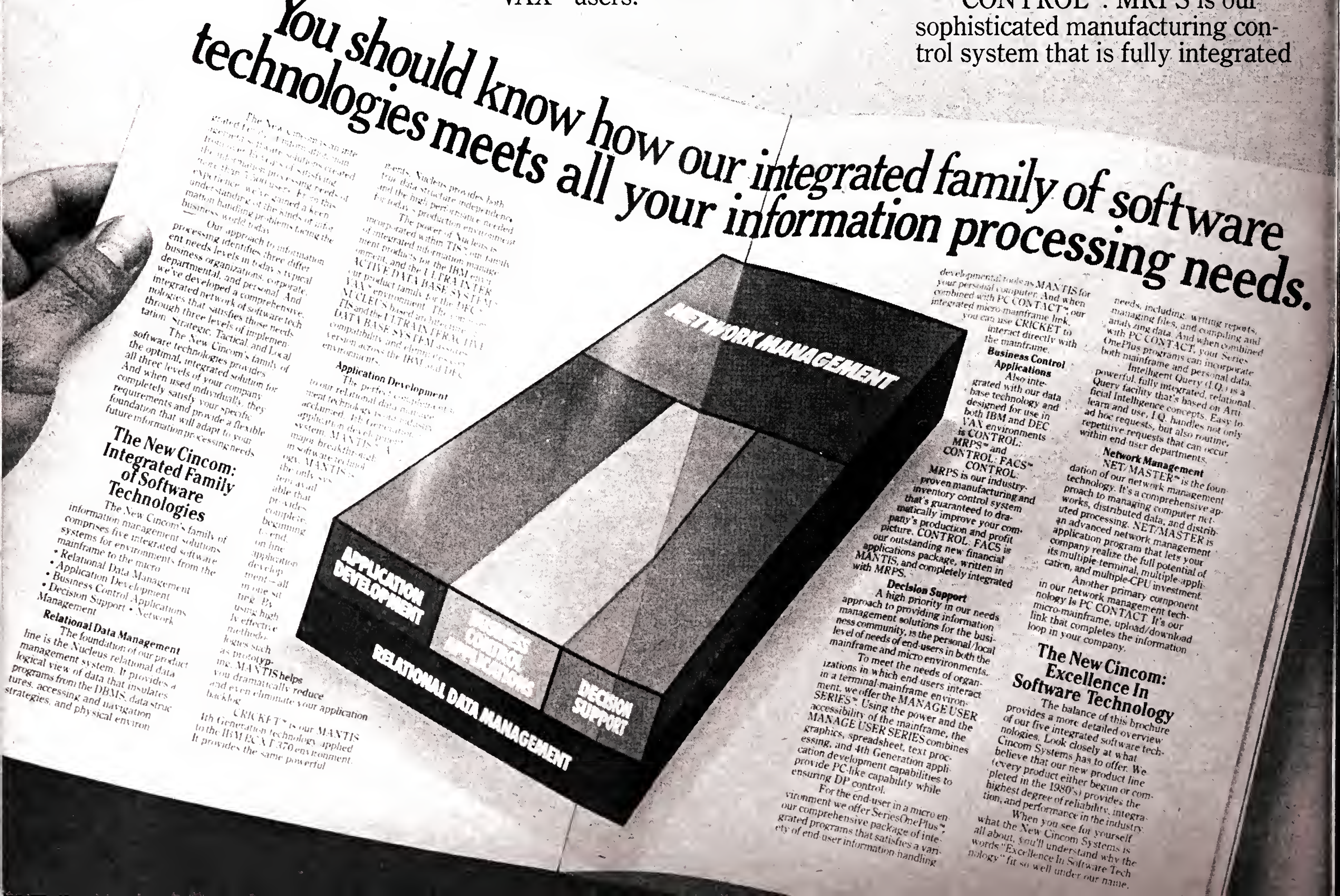

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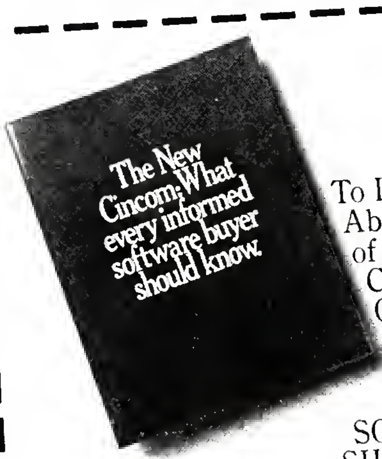
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George Harrar

BOOK REVIEWS

LOCAL-AREA NETWORKS IN LARGE ORGANIZATIONS
By Thomas Madron

The author's premise is simply stated: It costs a large organization more not to install a state-of-the-art local-area network than it does to build one — in the long run, of course.

Madron is in favor of the broadband approach, based on his experience as manager of Computer Services at North Texas State University. Nearly seven miles of trunk line, 3,000 outlets and several hundred nodes cover the campus in a broadband network that is still evolving.

The "manager's briefing" subtitle aptly reflects the book's purpose of bringing readers up-to-date on the issues without overwhelming them with detail.

Technical terms are defined, but Madron clearly regrets the kind of network debate based on technical comparisons of systems. The relevant question is not what networking scheme is better technically; the manager should ask himself, "What problems do I need to solve?"

Paperback, 150 pages, $16.95, ISBN 0-8104-6205-2. Hayden Book Co., 10 Mulholland Drive, Hasbrouck Heights, N.J. 07604.

ALAN TURING: THE ENIGMA
By Alan Hodges

No one in the computer industry really needs to know 587 pages worth of Alan Turing's life. Much of this biography, in fact, you don't even want to know — his until-now secret affairs with schoolmates and his predictably awkward passage through public school in England, for instance.

Turing the mathematician helped crack Germany's World War II code. Turing the designer devised the Automatic Computing Engine ("with a memory capacity of a minnow") at the time the Electronic Numerical Integrator and Calculator was taking shape in the U.S.

Decades ago, he debated the virtues of infallibility and intelligence as machine attributes. He wrote: "It is easy for us to regard [a human mathematician's] blunders as not counting and give him another chance, but the machine would probably be allowed no mercy. In other words then, if a machine is expected to be infallible, it cannot also be intelligent."

Could even an intelligent machine produce a sonnet the equal of Shakespeare's? Turing answered in 1949 that this question was "perhaps a little bit unfair because a sonnet written by a machine [would] be better appreciated by another machine."

After arrest for his sexual relationships, Turing submitted to hormone therapy. A year later, June 7, 1954, he poisoned himself.

Author Andrew Hodges laboriously researched one of the most intriguing minds in computer history and apparently felt compelled to write down everything he found. The result is that Turing loses the mystery that first draws you to him. He is no longer an enigma.

Paperback, 587 pages, $10.95, ISBN 0-671-52809-2. Touchstone Books, Simon & Schuster, 1230 Avenue of the Americas, New York, N.Y. 10020.

DIAGRAMMING TECHNIQUES FOR ANALYSTS AND PROGRAMMERS
By James Martin and Carma McClure

Another James Martin book, you ask? This one, with writing sidekick McClure, calls on the DP executive to prepare for the coming revolution — computer-aided systems analysis and computer-aided programming. It is a revolution that goes beyond structured programming: A computer will generate code from the systems design that the designer creates on his graphics screen.

Martin and McClure take analysts, programmers and their managers on a walk through conventional diagramming — a kind of refresher course. The authors picture Warnier-Orr and Michael Jackson diagrams, flowcharts, structure charts and much more in great detail.

This book is less an argument for one point of view than an explanation of many views on diagramming.

Hardcover, 396 pages, $40, ISBN 0-13-208794-4. Prentice-Hall, Inc., Englewood Cliffs, N.J. 07632.

BOOKS OF NOTE

THE COMPUTER CRIME LAW REPORTER, a compilation of laws in effect in 33 states, edited by Jay BloomBecker. Paperback, 200 pages, $45. National Center for Computer Crime Data, 4053 JFK Library, California State University-Los Angeles, 5151 State University Drive, Los Angeles, Calif. 90032.

ARTIFICIAL INTELLIGENCE & ROBOTICS: FIVE OVERVIEWS, covering AI, robotics, expert systems, vision and natural language processing. Hardcover, 643 pages, $103.50. Business/Technology Books, P.O. Box 574, 14 Evergreen Drive, Orinda, Calif. 94563.

THE SOFTWARE HANDBOOK, a guide to techniques and methodologies used in project management, systems analysis, programming, testing, documentation and quality assurance, by Dimitris Chorafas. Hardcover, 461 pages, $49.95, ISBN 089433-248-1. Petrocelli Books, Inc., 1101 State Road, Princeton, N.J. 08540.

Publishers wishing to have their books considered for review can direct books, prepublication galleys, press releases, catalogs or other information to George Harrar, Book Review Editor, Computerworld, *P.O. Box 880; 375 Cochituate Road, Framingham, Mass. 01701.*

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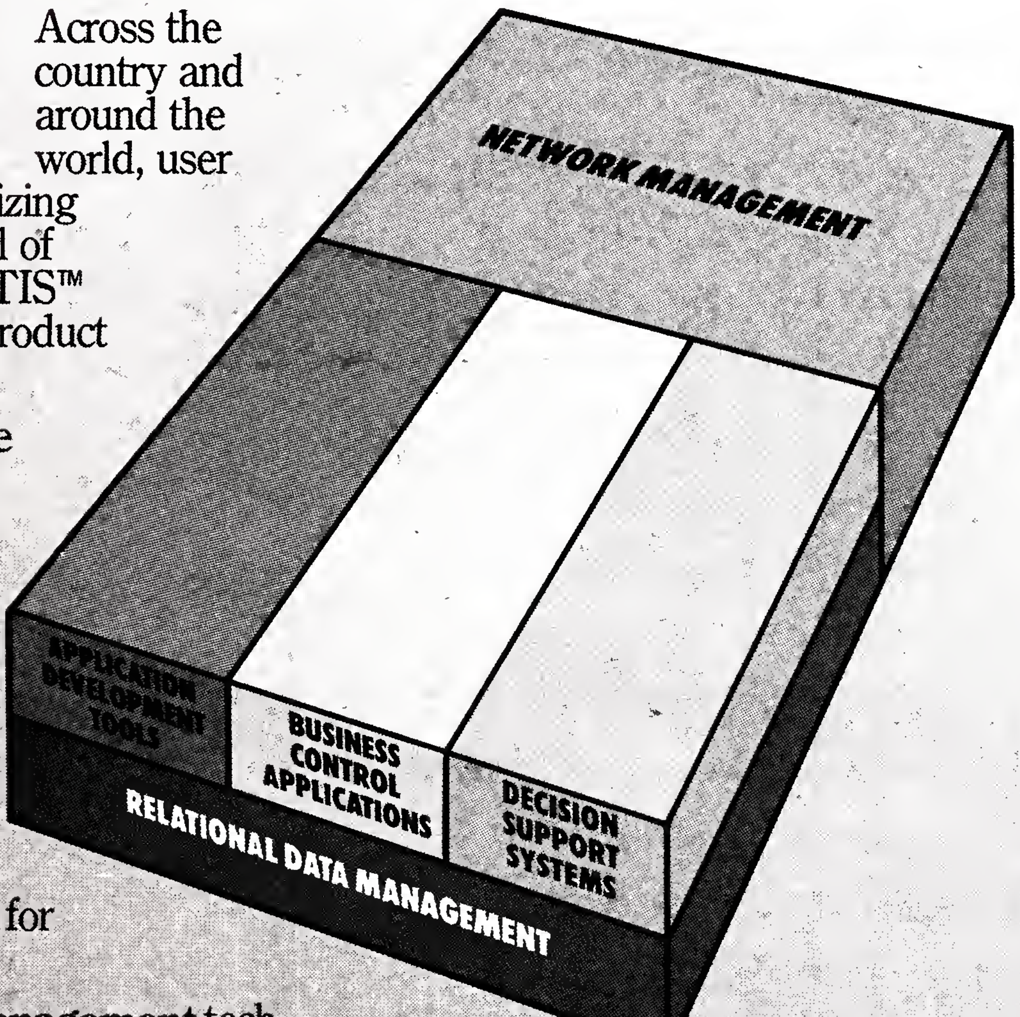
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NEWS

Pie shop deserts old system for speech board accounting

LONG BEACH, Calif. — A restaurant chain is saving up to $5,000 in service bureau fees by using microcomputers with speech boards to process daily sales and bank deposit reports from its restaurants.

Marie Callender Pie Shops, Inc. based here, had been receiving its daily reports for several years from Automatic Data Processing, Inc. (ADP) on a contract through Crocker Bank. That service required the restaurant accountants in the field to read their daily reports over the telephone to ADP operators, who keyed the data into ADP's system for daily downloading to a printer at the Marie Callender headquarters. There, the data was keyed into Marie Callender's Texas Instruments, Inc. 990/12 Model 30 minicomputer.

The chain wanted a new system and stumbled upon it when the minicomputer was being serviced.

"I got onto the idea when a TI serviceman was servicing the mini, and I noticed that he was calling Texas and punching numbers into the phone. It looked like he was communicating with a computer. He was using the phone to order parts. I thought we [could] use something like that here," said Frits W. Van Oppen, an internal consultant for Marie Callender.

Marie Callender purchased two TI Professional Computers equipped with TI's Speech Command Hardware Kit and TI's Speech Command System. Including the cost of off-the-shelf software, a memory expansion card and developing an application to handle the report accounting, the company spent $20,000 for the systems. Van Oppen said that cost should be recovered in January or February as the company saves the $4,500 to $5,000 it was paying to ADP.

The micros were installed in September, and the 58 company-owned restaurants and coffee shops were added to the reporting network in phases through mid-October.

Today, each restaurant makes daily reports that take from one to two minutes.

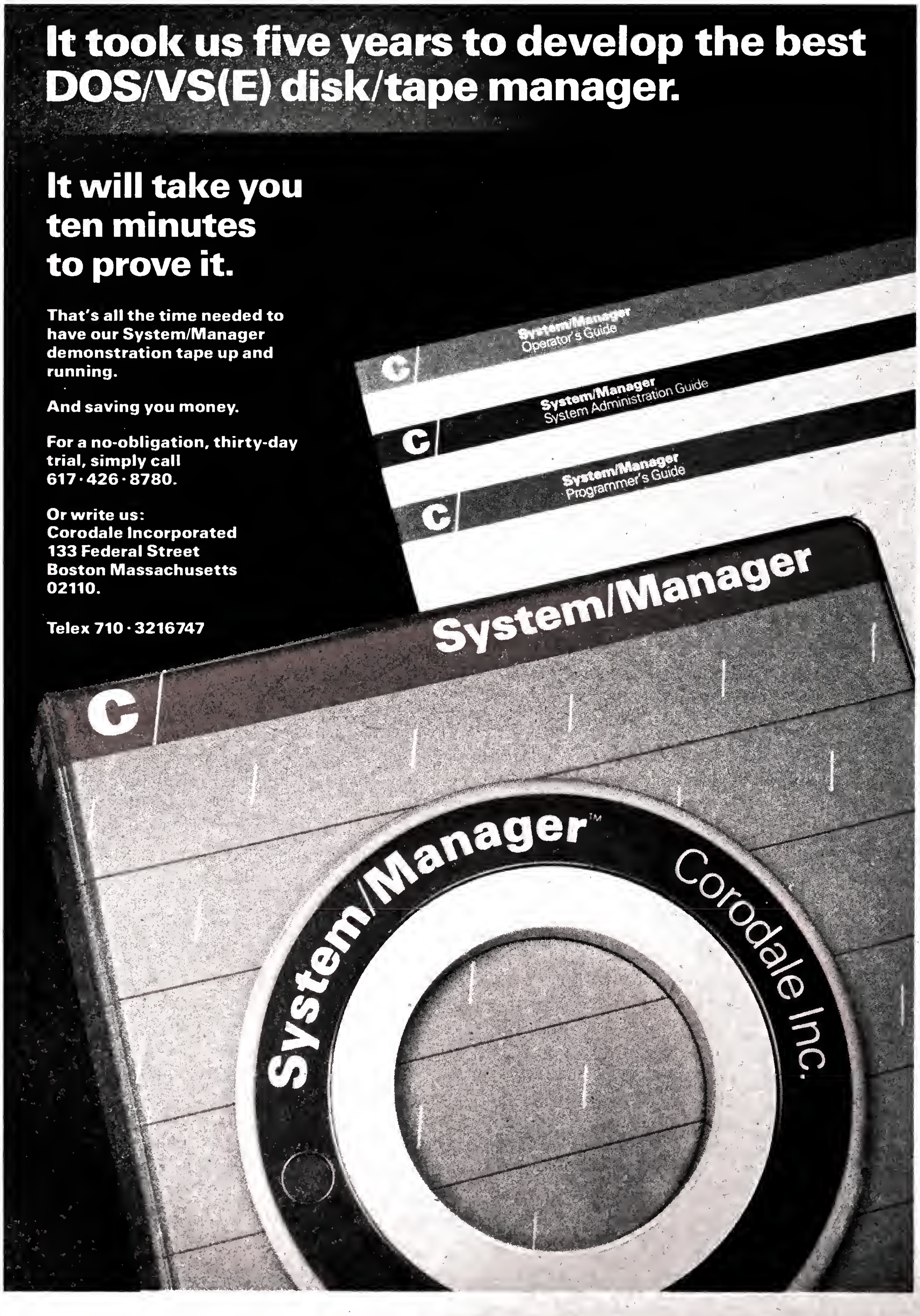
Touch-Tone preferred

Callers now familiar with the procedure prefer Touch-Tone input to the micros over talking to a service bureau operator using a CRT, Van Oppen said. Because it uses voice playback for verification, the micro is slower than the CRT operator, who verifies no data. The program that Marie Callender's staff wrote makes several tests of the data and will not accept the result if the entry is unbalanced.

"One of the big improvements over ADP is the editing capability. ADP didn't do any editing, which means making sure that the data is valid and that the details for the deposits agree with the total of the deposits. If they didn't agree before, ADP would throw them into the edit column. The [personal computer] forces the caller to resolve the problem before the call is terminated," Van Oppen said.

He added that the only expense for the remote restaurants is the cost of a telephone call. When making a report, a caller uses a standard Touch-Tone telephone to punch in details such as the restaurant identification number, the previous day's sales, the number of bank deposits and the number of credit card sales. The caller responds to voice prompts recorded by headquarters office manager when the system went on-line.

Van Oppen noted that the company appreciates the savings and the data integrity and that office personnel are happy with the system because it eliminates the need to key data into the minicomputer. "There's no cost at all at the store end, and it's much cleaner on our end," he said.



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CALENDAR

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DECEMBER 27, NEW YORK — **Sysed, Inc.'s Annual Training Forum.** Contact: Sysed, 35 W. 35th St., New York, N.Y. 10001.

DECEMBER 27-28, NEW YORK — **CICS Performance Design.** Contact: Sysed, Inc., 35 W. 35th St., New York, N.Y. 10001.

WEEK OF DEC. 30

JANUARY 2-4, HONOLULU — **Hawaii International Conference on System Sciences.** Contact: Nem B. Lau, Center for Executive Development, College of Business Administration, University of Hawaii, 2404 Maile Way, C-202, Honolulu, Hawaii 96822.

WEEK OF JAN. 6

JANUARY 7-8, KANSAS CITY, MO. — **Discover Unix.** Contact: Data-Tech Institute, P.O. Box 2429, Lakeview Plaza, Clifton, N.J. 07015. Also being held Jan. 10-11 in Boston, Jan. 14-15 in Houston and Jan. 17-18 in San Francisco.

JANUARY 7-8, HARTFORD, CONN. — **Unix Systems Users Workshop.** Contact: Don Florek, The Hartford Graduate Center, 275 Windsor St., Hartford, Conn. 06120.

JANUARY 7-8, DALLAS — **Operating Systems: A Comparative Analysis.** Contact: Data-Tech Institute, P.O. Box 2429, Lakeview Plaza, Clifton, N.J. 07015. Also being held Jan. 14-15 in Boston.

JANUARY 7-9, ARLINGTON, VA. — **SAS Basics Course.** Contact: SAS Institute, Inc., P.O. Box 8000, Cary, N.C. 27511. Also being held Jan. 9-11 in Tampa, Fla.; Jan. 15-17 and Jan. 23-25 in Cary, N.C.; and Jan. 22-24 in San Francisco.

JANUARY 7-9, NEW YORK — **PC/Focus for Beginners.** Contact: Julie Leonard, Advanced Infostructures, Inc., 475 Fifth Ave., New York, N.Y. 10017.

JANUARY 7-9, DALLAS — **VM/SP Structure, Flow & Tuning.** Contact: Betty Bruce, Goal Systems International, Inc., 5455 N. High St., Columbus, Ohio 43214.

JANUARY 7-10, NEW YORK — **CICS Debugging.** Contact: Sysed, Inc., 35 W. 35th St., New York, N.Y. 10001.

JANUARY 7-10, HARTFORD, CONN. — **Designing On-Line Systems.** Contact: Don Florek, The Hartford Graduate Center, 275 Windsor St., Hartford, Conn. 06120.

JANUARY 7-11, HARTFORD, CONN. — **CICS/VS Command-Level Coding Workshop.** Contact: Don Florek, The Hartford Graduate Center, 275 Windsor St., Hartford, Conn. 06120.

JANUARY 7-11, RALEIGH, N.C. — **Unix Workshop.** Contact: Suzanne Battista, Course Manager, Plum Hall, Inc., One Spruce Ave., Cardiff, N.J. 08232.

JANUARY 7-11, HARTFORD, CONN. — **OS/VS Job Control Language & Utilities.** Contact: Don Florek, The Hartford Graduate Center, 275 Windsor St., Hartford, Conn. 06120.

JANUARY 8-9, SAN FRANCISCO — **Integrating Multivendor Voice and Data Networks.** Contact: Marilyn Chasteen, The DMW Group, Inc., 2020 Hogback Road, Ann Arbor, Mich. 48104.

JANUARY 8-10, CHICAGO — **Corporate Electronic Publishing Systems: A Conference/Showcase.** Contact: Corporate Electronic Publishing Systems, Cahners Exposition Group, P.O. Box 3833, 999 Summer St., Stamford, Conn. 06905.

JANUARY 8-10, LOS ANGELES — **Selecting a Local-Area Network.** Contact: Marketing Manager, Technology Concepts, Inc., Old County Road, Sudbury, Mass. 01776.

JANUARY 8-10, COLLEGE PARK, MD. — **Designing Interactive Computer Systems: A Software Psychology Workshop.** Con-

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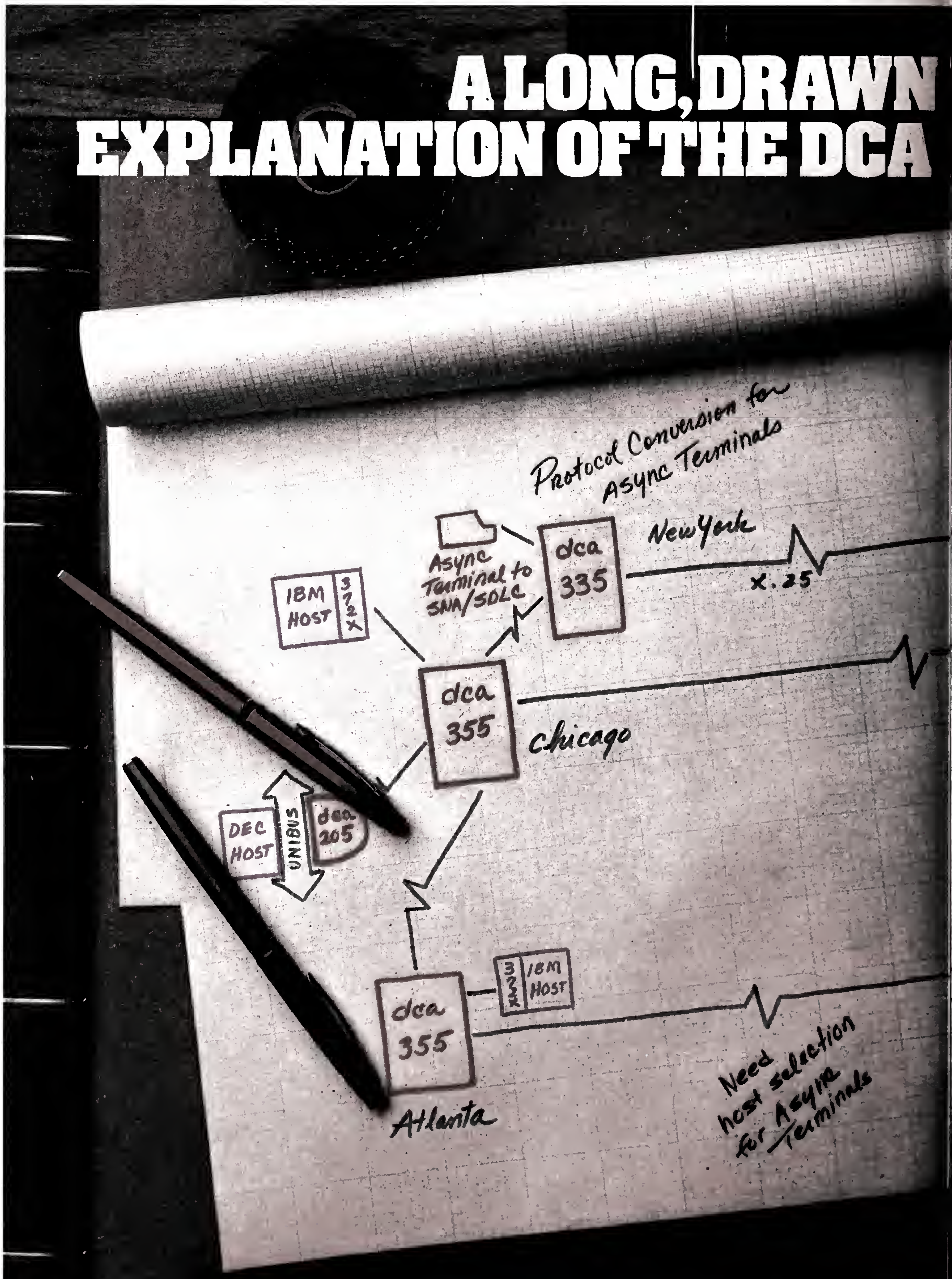

NEWS

tact: Conferences and Institutes Program, University College, University of Maryland, University Blvd., College Park, Md. 20742.

JANUARY 8-10, CARY, N.C. — **SAS Programming for New Computer Users.** Contact: SAS Institute, Inc., P.O. Box 8000, Cary, N.C. 27511. Also being held Jan. 22-24 in Cary, N.C.

JANUARY 8-11, NEW YORK — **Vsam.** Contact: Sysed, Inc., 35 W. 35th St., New York, N.Y. 10001. Also being held Jan. 28-Feb. 1 in New York.

JANUARY 9-11, NEW YORK — **Systems Network Architecture: Concepts, Design and Implementation.** Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Gary St., Santa Ana, Calif. 92705. Also being held Jan. 21-23 in Los Angeles.

JANUARY 9-11, ARLINGTON, VA. — **SAS Macro Language.** Contact: SAS Institute, Inc., Box 8000; Cary, N.C. 27511.

JANUARY 9-11, HARTFORD, CONN. — **Unix C Programming Language Workshop.** Contact: Don Florek, The Hartford Graduate Center, 275 Windsor St., Hartford, Conn. 06120.

JANUARY 9-11, CARY, N.C. — **SAS Applied Time-Series Analysis & Forecasting Course.** Contact: SAS Institute, Inc., P.O. Box 8000, Cary, N.C. 27511.

JANUARY 9-11, CHICAGO — **Relational Data Bases.** Contact: Software Institute of America, 8 Windsor St., Andover, Mass. 01810. Also being held Jan. 14-16 in Atlanta.

JANUARY 9-11, WASHINGTON, D.C. — **National Conference on Financial Management Systems for Government.** Contact: U.S, Professional Development Institute, 1620 Elton Road, Silver Spring, Md. 20903.

JANUARY 10, SAN FRANCISCO — **T1 Carrier Strategies: The New Networking Imperative.** Contact: Marilyn Chasteen, The DMW Group, 2020 Hogback Road, Ann Arbor, Mich. 48104.

JANUARY 10-12, HOUSTON — **The Essentials of Productivity Management.** Contact: The Institute of Industrial Engineers, Continuing Education Program, 25 Technology Park/Atlanta, Norcross, Ga. 30092.

JANUARY 12-13, NEW YORK — **CICS Command-Level Intensive.** Contact: Sysed, Inc., 35 W. 35th St., New York, N.Y. 10001. Also being held Jan. 19-20 in New York.

WEEK OF JAN. 13

JANUARY 13-16, NEW YORK — **Annual Convention and National Retailers Business & Equipment Exposition.** Contact: National Retail Merchants Association, 100 W. 31st St., New York, N.Y. 10001.

JANUARY 13-16, HONOLULU — **Seventh Annual Conference of the Pacific Telecommunications Council.** Contact: Pacific Telecommunications Council '85, Suite 308, 1110 University Ave., Honolulu, Hawaii 96826.

JANUARY 14-15, SAN FRANCISCO — **Taking Charge: New Directions for Data Entry Management.** Contact: Marilyn Bodek, Data Entry Management Association, P.O. Box 16711, Stamford, Conn. 06905.

JANUARY 14-15, HARTFORD, CONN. — **Personal Computers — Hands-On Workshop.** Contact: Don Florek, The Hartford Graduate Center, 275 Windsor St., Hartford, Conn. 06120.

JANUARY 14-16, ST. LOUIS — **DOS/VSE Internals, Debugging & Problem Determination.** Contact: Betty Bruce, Goal Systems International, Inc., 5455 N. High St., Columbus, Ohio 43214.

JANUARY 14-17, ANAHEIM, CALIF. — **Cadcon West '85 Conference & Exposition.** Contact: Morgan-Grampian Expositions Group, Two Park Ave., New York, N.Y. 10016.

OUT
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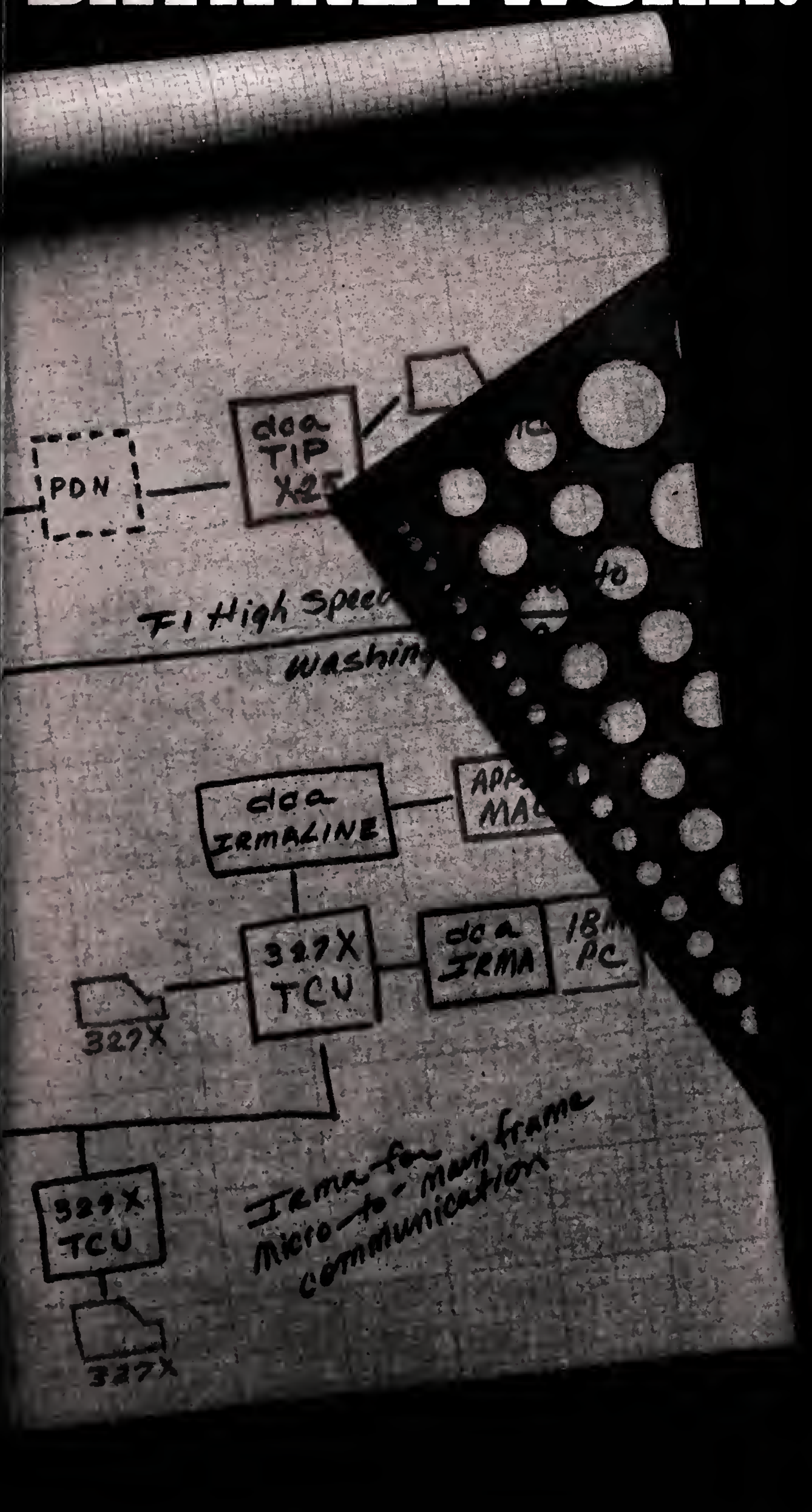

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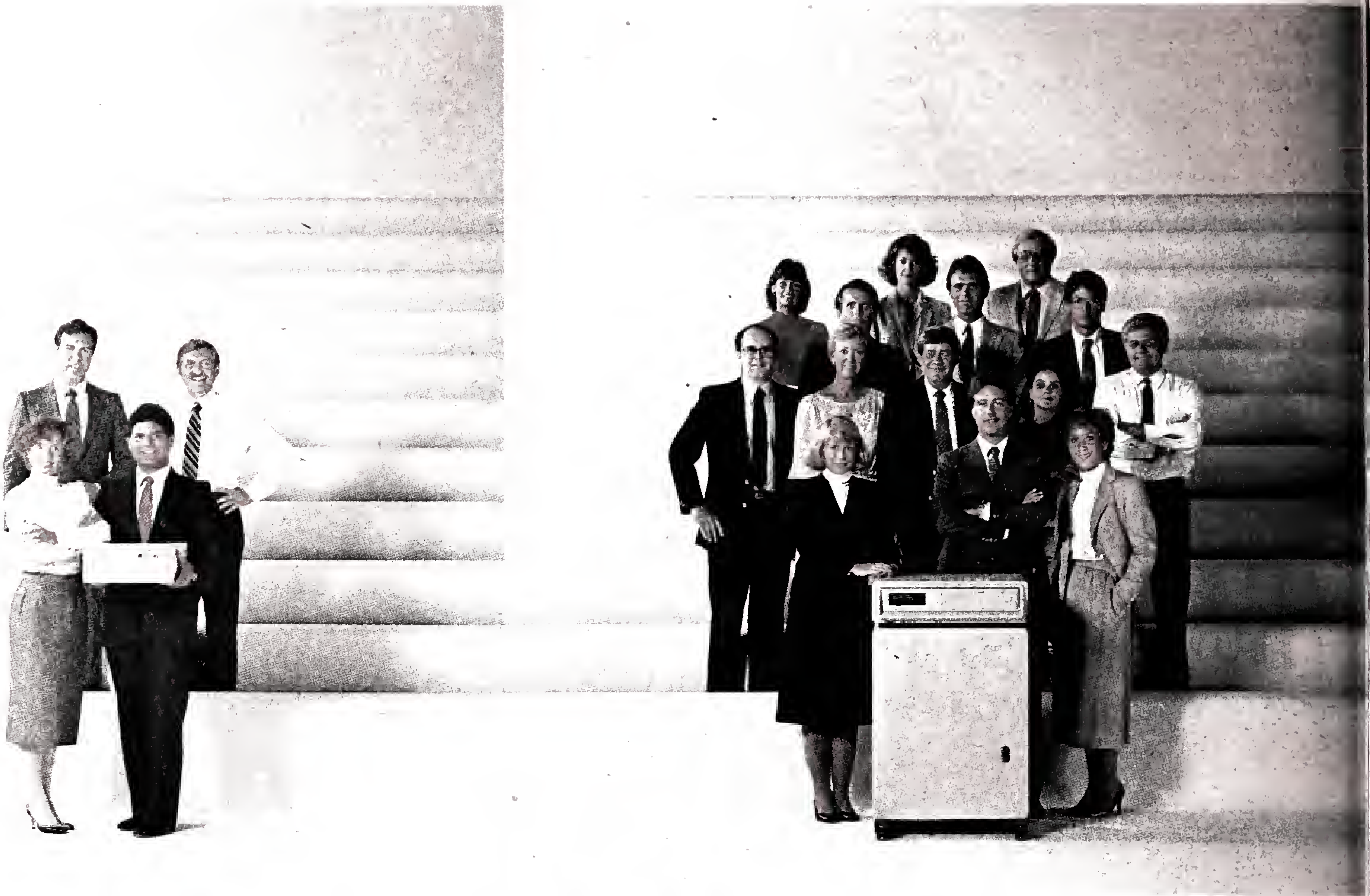

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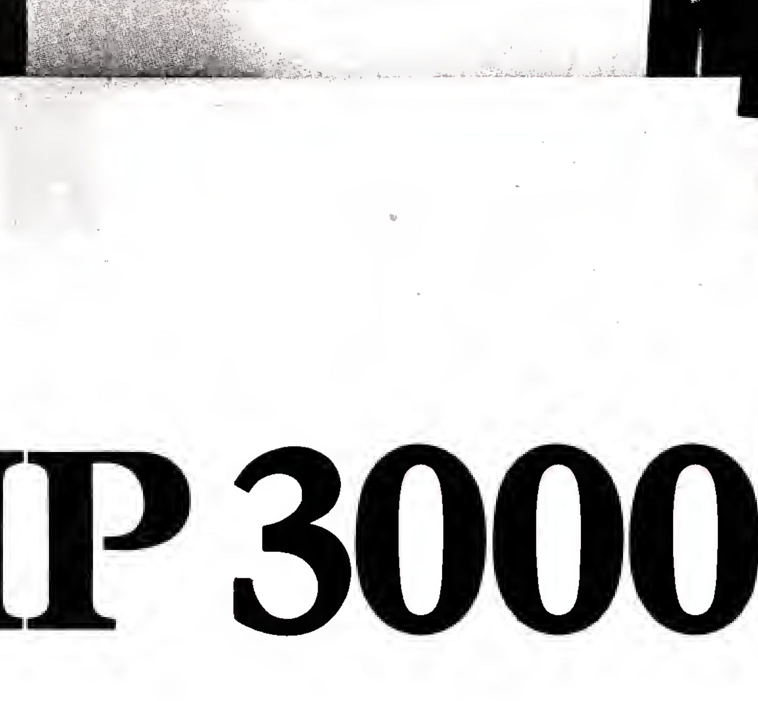

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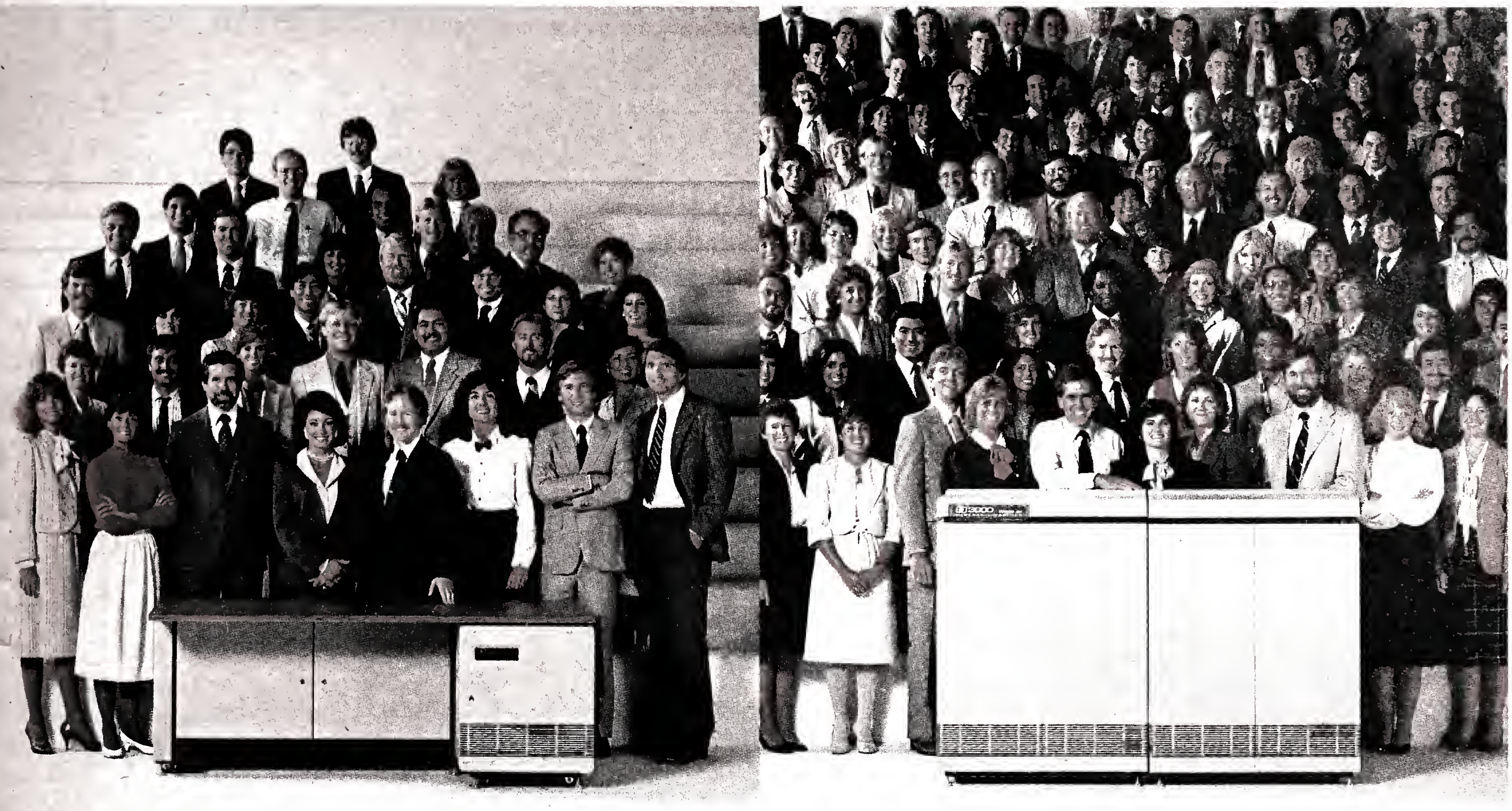

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EDITORIAL

Who's liable for DP security?

We went to some lengths last week in this space to make a case for the U.S. government's mass computerization of personal records, despite all the warnings to the contrary heard during this year of George Orwell.

Our point was that while the potential for harm to our civil liberties is ever present, the zeal to protect those liberties has acted as a defense against that potential harm.

During the past month, a titillating story has unfolded that makes a mockery of the term "system security," but this time in the private sector.

A reporter for *Newsweek* wrote an article in November casting youthful hackers in a bad light — to say the least — and recommended their punishment befit a serious crime. As television apparently no longer provides the vicarious thrills it once did to keep the youth of America preoccupied, hackers angry at the reporter broke into his credit files kept at TRW, Inc. They then posted the reporter's credit card numbers, purloined from the not-so-secure credit files. These were kids, using micros, telephones and modems, who have ingested a healthy dose of unmitigated gall and disrespect for privacy.

The hackers then proceeded to make life utterly miserable for the reporter, alerting others, via electronic bulletin boards, to make harassing phone calls to him. They also held what may be the first all-electronic "court" to decide what "sentence ought be imposed on the reporter."

A couple of points: First, the hackers probably found breaking into TRW's credit files as easy as stealing a bank's password, which probably involved nothing more than picking through garbage for discarded computer printouts.

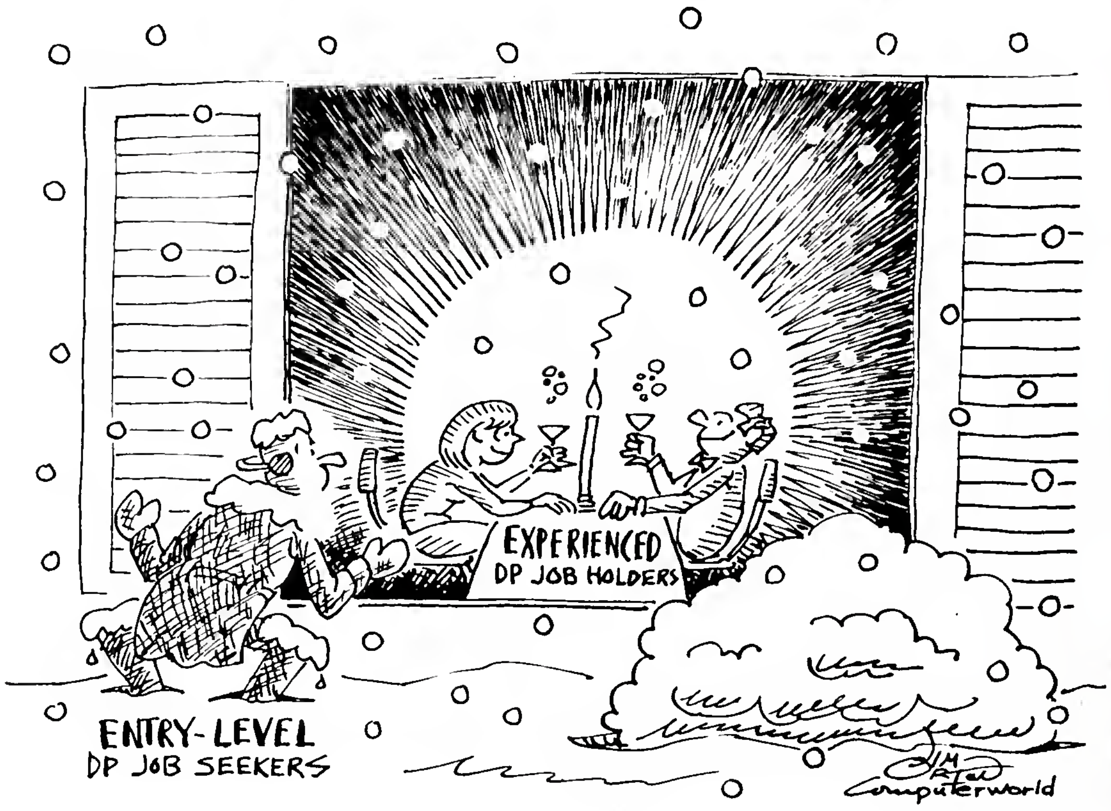
Second, this wasn't the first time in very recent history that someone broke into TRW. The company, which maintains credit records on millions of private citizens (120 million records, according to *Newsweek*), had its files illegally accessed in June [CW, July 2]. That time, the hackers apparently were content just to break in, leaving the files intact.

But in the more recent incident, the hacking was done with a vengeance and with a specific target in mind. Someone said, "Let's get this guy; I know just how."

TRW said it has done what it can to make its system secure. Clearly, that is far from enough and a poor excuse for allowing, if not inviting, more of the same.

Yes, there are laws against hacking. There are also laws against littering. Get caught doing either, and you're not likely to end up in jail.

Clearly, the responsibility for security rests with companies like TRW that dispense potentially volatile information on private citizens and with these companies' clients who use personal credit information like the Lenox (Mass.) Savings Bank, whose password was used in the illegal entry to the reporter's credit information. And if these companies cannot assume responsibility for security of personal files, what would happen if they were government agencies?



LETTER

Siding with employees

Concerning the article "GM employees win some, lose some in transfer to EDS" [CW, Nov. 12], it should be realized that takeovers like this always produce touchy situations for employees caught in the middle, though EDS has had more than its share of problems in this regard. However, EDS Senior Vice-President Ken Riedlinger's statement that "I don't think there is a company in the world that pays greater attention to the needs of employees than EDS" is absurd and must not go unchallenged.

The fact is EDS does not extend to its employees some basic benefits that are universally accepted, such as shift differential for hourly employees on night shifts and pay for accumulated vacation time not taken when an employee leaves the company. The firm did not give hourly employees time and a half for overtime until forced to by a court.

Additionally, the strict dress code, military atmosphere, policy of escorting employees out the door instantly when they resign, merciless after-hour demands put on its programmers and the infusion of H. Ross Perot's personal values into the regulations by which EDS employees must abide are great infringements on the rights of the people who work for EDS.

EDS has long recognized that many of its employees were quite unhappy with EDS policies. They have used internal surveys and commissioned outside help to identify the problems and made some changes based on the results. But the fundamental way EDS treats its employees has not changed.

See **EDS** page 40

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VIEWPOINT

Those lovable cash robots

LECHT ON SCIENCE
Charles P. Lecht

"I love those money machines," my friend said. No hassle; just walk right up, dial in your code, take a little quiz and if you pass it, the money machine pays off in twenties, tens, ones and sometimes even twos."

His statement got me thinking that almost all the people I work with, including me, use automated teller machines (ATM) — euphemistically referred to as money machines. While I don't know if I would ever go so far as to say that I "love" them, I must confess that they've proven to be an enormous convenience to me, and as far as I can see, to everyone else. They may qualify as the first white-collar robot in the history of mankind that most people actually like; in fact, some seem to love them.

For example, working New Yorkers seem to prefer them to lunch. Homemakers bring their kids in station wagons, which they leave double-parked with the motor running and a kid at the wheel, while they race in to use the machine. Often, a tail-wagging dog is seen in line. My Kerry blue terrier, Mozart, can't pass the place I use without lunging toward its door as he does in front of the deli.

Let's face it, we'll miss and perhaps never really be able to do without the clean-shaven, necktied, young teller who raised his eyebrow when given a withdrawal slip, checked your signature against his record card and begrudgingly handed over the cash. Or the sweet, crisply dressed woman who knew your entire financial history and tried to discourage you from wild spending by commenting on the weakening economy and what austerity measures a lame-duck president was likely to take after Christmas.

But, as much as we may miss this human interaction, we cannot let it stand in the way of progress and must bid it good-bye in favor of those lovable (oops, I said it) little cash-machine robots. Anyway, now you may withdraw more cash than you ought to with the confidence that no one but your computer knows.

Some ATMs are dressed like Santa Claus for the holidays. Because so many people will use ATMs for the first time this Christmas, I thought I'd give some practical advice on the subject.

First of all, I want to confirm that once having identified yourself to the machine by keying in your code name and answering all the multiple-choice questions correctly, the lovable robot's gaping, steel mouth usually opens to provide you with cold, hard cash. No recriminatory, guilt-producing remarks are made, nor does the robot change its expression. You are now free to go on a spirit-uplifting spending spree.

Visit machine alone, at night

This being an imperfect world, not all cash withdrawal encounters with an ATM actually produce cash. It's extremely rare that the machine is at fault (although they do run out of cash) and far more likely that you are (having run out of credit). While failure at the machine doesn't inspire the disapproving stares of a bank employee, it's usually better if you visit the machine alone at night if there's any doubt that you'll succeed in your contemplated transaction.

When you do this, it may be wise to ensure that a policeman is within earshot. Lose a video game, and no one pays attention; an unsuccessful session with an ATM can attract it. Most ATMs are situated in such a way that people awaiting their turns, accompanying friends or peering through windows may figure out what you're up to in visiting the machine, especially if you display any kind of negative emotion during use.

I advise that a transaction that doesn't produce the cash you wanted, especially around the holidays, should be responded to with a smile, as though the denial message on the tube were nothing more than confirmation of a large excess. Leaving disgruntled can cause others to wonder why you've been turned down and may inspire them to exhibit standoffish or aloof behavior. Mumbling "I guess it's out of cash," and posting a sign to that effect is unwise. If someone decides to try to use the machine anyway, it can ruin your credit with local merchants.

Faceless automation and societal breakdowns

If you have a friend waiting for your transaction to produce cash that you were going to turn over as a loan or, worse, as a loan repayment, and none appears, you may do well to curse faceless automation as the source of too many societal breakdowns and laughingly express a longing for the good old days when you could talk to someone to straighten the matter out there and then. Of course, you must make sure the bank isn't still open.

It's better not to take children under 13 to an ATM that is dressed as Santa because of the still unproven but suspected aftereffect of a hard-to-cure machine attachment in the still-believing-in-Santa child. And never send any kid under, say, 150 lb, however trustworthy he may be, to the money machine without first hiding a transmitter in his clothing. Remember, there's no bespectacled teller to see the child who's asking for the cash but plenty of people to watch him get it.

And, never key in your secret code with a baby who is on the verge of reading perched on your arm. Later on, he'll be able to reach the keyboard and gaping robot's mouth and, well, kids will be kids.

On rare occasions, our lovable cash robots break down and turn over more cash than you've asked for. Some have been known to exhibit extreme generosity by turning over all the cash they've got, hiccuping it out $200 at a time. The odds of this happening are very low, but I thought I'd mention it before I close.

Suppose the machine does start to hiccup up all its cash, what should you do? Procedures for handling this vary from bank to bank, so my advice ends here. But my instincts tell me that you may want to avoid rejoicing or kissing the lovable robot. Better to look disgusted, punch it, angrily tear up some withdrawal slips, and take the money and run. Happy holidays.

Lecht is chairman of Lecht Sciences, Inc., a New York-based think tank specializing in computer and communications technologies.

DBMS role in fourth-generation languages

READER'S PLATFORM
Ken Zearfoss

With the current proliferation of user-friendly fourth-generation languages, there has also been an increase in the number of so-called user-friendly data base management systems. Many fourth-generation languages claim to be or include their own DBMS. As with other data processing terms, the term DBMS has been kicked around quite a bit, being applied to anything that uses indexed files. To what extent do these languages offer fully functional DBMS capabilities?

To answer this question, we should first identify the essential characteristics of a DBMS. I believe that there are four such characteristics a DBMS must provide.

- ■ The ability to define logical access paths/methods that are distinct from the physical access paths/methods.
- ■ The ability to define a logical unit of work.
- ■ The ability to share data between various users and applications.
- ■ Adequate recoverability and auditibility.

Let's examine these characteristics in more detail and see if a fourth-generation language approach can provide the functions necessary for each.

The lack of support from fourth-generation languages for a logical unit of work is a fatal flaw to their claim to provide DBMS capabilities.

The first logical access paths/methods, is in a traditional DBMS accomplished through pointers and/or secondary indexes. A fourth-generation language will create alternate paths through the data in the same way but will often not need to be told at file definition time what physical means to use to accomplish this logical access. (If physical means must be specified in a fourth-generation language, these specifications are considerably simplified from those necessary for a traditional DBMS.) The advantage of this is that time, effort and expertise need not be spent up front to develop a file which may be viewed in different ways. A disadvantage is that tuning for minimal usage of computer resources through these logical accesses is much more restricted, a disadvantage that will have less and less impact as man-hour costs rise and computer costs fall. Fourth-generation languages do a fine job of providing users with file views.

The second characteristic, a logical unit of work, can be considered to be a grouping of one or more transactions that must be either completed or aborted as a whole, if the data they operate against is to retain its integrity.

For example, consider the transfer of $1,000 from one account into 10 accounts of $100 each. It should be obvious that for this transfer to be completed properly, 11 separate update actions must be performed. (The $1,000 should be deleted from the first account, and 10 separate additions of $100 should be made against the other accounts.) By defining this transfer as a logical unit of work, one can expect a traditional DBMS to complete or reject the transfer.

A traditional DBMS supports a logical unit of work through two concepts. The first of these is the data queue. When, during a logical unit of work, changes are made to the data, these changes are written to the data queue and are not written back to the file until this logical unit of work is complete. Thus, if an abend occurs during an update action within a logical unit of work, none of the changes

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Zearfoss is a member of a newly formed Pittsburgh-based data base design group that develops subject data bases.

VIEWPOINT

DBMS

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made by prior update actions within this logical unit of work are applied to the file. In this way, the integrity of the data is ensured.

At this point, the second concept, dynamic back out, takes over. Dynamic back out removes all the changes written to the data queue by the update actions for an unsuccessfully completed logical unit of work. This frees up the data queue for receiving changes from other update actions.

To the best of my knowledge, no fourth-generation language supports the logical unit of work characteristic. A fourth-generation language will provide data integrity to the data base call level, but as seen from the example above, this is not always sufficient to guarantee data accuracy. The lack of support from fourth-generation languages for a logical unit of work is a fatal flaw to their claim to provide DBMS capabilities.

Data sharing is the third characteristic, and one that, for the most part, fourth-generation languages satisfy. Files may be updated by more than one user simultaneously. However, there is an aspect of data sharing that fourth-generation languages do not address. This is program isolation, the resolution of data contentions. Since fourth-generation languages fail to provide for a logical unit of work, they must treat each data base call as a separate, recoverable action. This means that a procedure is unable to lock out any other procedure from using any data base record other than the one referenced by its most current call. If one considers the example of the $1,000 transfer given earlier and adds to it a separate transaction to update one of the receiving accounts, one can see where problems may occur. Since fourth-generation languages provide no data contention checks, it is up to the programmer to supply code for all possible conditions of data contention.

The final characteristic, recoverability and auditability, refers to whether sufficient and usable logging of activity and updates against the file are maintained. In my experience, fourth-generation languages do not provide adequate logging capabilities. This means that logging functions must be created anew for each application. Worse yet, there can be no vendor-supplied utilities for reading a self-developed log file. Thus, it becomes the responsibility of the programmer to supply the code that will ensure that auditability and recovery can take place.

What can we conclude from all this? If the four characteristics I mentioned earlier are accepted as essential for a DBMS, then we can say that fourth-generation languages only partially satisfy two of these characteristics and entirely fail to support another one. This means that if you still wish to use a fourth-generation language as a DBMS, you will be forced to accept systems where your programmers coded the routines to resolve data contentions and provide auditability and recovery and where, because of a lack of data queues and dynamic back outs, the integrity of the data within this system can never be assured.

I believe that fourth-generation languages are extremely powerful and flexible tools for creating data processing systems and, as they continue to evolve, will play a larger and larger role in the overall data processing world. However, for the present, they provide incomplete DBMS capabilities and should not be used as such.

EDS

from page 38

In 1980, EDS started requiring programmers to sign three-year, $9,000 promissory notes before taking part in EDS' programming training course. This unusual move was deemed necessary to keep programmers from leaving. Surely this would not be necessary if EDS "takes care of every legitimate employee need."

EDS is unique in many ways. It has been innovative, provided excellent education and developed very good computer systems. If EDS would like to take pride in its uncompromising methods, that is one thing. But Riedlinger's claims are just not true. EDS has gained a well-deserved reputation as a company out of touch with its employees' needs.

Douglas Miller
Foster City, Calif.

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Micro-mainframe links pose array of security risks

By Owen Boyd
Special to CW‡

The driving force behind micro-mainframe technology is simple: Today's end user wants to get at his mainframe data with his personal computer. He wants to manipulate that data, and he wants to have the ability to update these mainframe data bases in real time and interact with his data without having to wait on DP to perform batch runs.

The new technology he is using to do this is the microcomputer-mainframe link.

This tool allows companies to be more productive and to compete on a higher level at a faster pace than ever before. But with this freedom of access come some very serious security risks. Before a plan is described to offset these risks, it is important to understand how the technology works.

Before link technology, it was possible to access the mainframe, but it was a tiresome process. First the user had to key all of that data into his personal computer. Often the data was inaccurate or old, leading to the danger of making bad decisions. Once the user had done his analysis on the personal computer, there was no way for him to update directly the mainframe data bases with the results of his analysis — he needed to enter the data again.

Micro-mainframe link software, in the simplest sense, allows the passing of data from the mainframe data base to the micro and from the micro to the mainframe.

Users can now access live mainframe data, select what they want when they want it and manipulate the data in unrestricted ways. In some cases, they have the option of updating the mainframe in real time. While the benefits are striking, so are the security implications.

A typical user of a micro-mainframe link might be a controller who is trying to close his month-end books. Suppose it is the last day of the month, and he has per-

See **LINK** page 48

Boyd is manager of product marketing and systems at McCormack & Dodge Corp., a vendor of a micro-mainframe link.

Avoid system design troubles by taking one block at a time

Second of a two-part series.

By Mike Ruggera
Special to CW‡

A typical procedure used when approaching the problem of developing a major system that consists of subsystems is to view the system as a single project. An effort is then made to analyze the data needs of all the subsystems and then integrate those needs into a composite data base design.

The complete schema is written and all the anticipated subschemas are written. Work begins on programming the first subsystem. Usually there are some unanticipated data requirements necessitating changes in both the schema and subschema. These changes cause some programs to be modified or rewritten because techniques that result in a lack of independence between the data and the programs have been employed. This results in some time and cost overruns, but the subsystem is completed.

Then work is begun on the second subsystem. The project manager believes he has a good feel for how long this subsystem will take to develop and prepares time estimates and work plans. The programming begins. Invariably, there are unanticipated data requirements. The schema and subschemas have to be changed. As a result, not only do the programs in this subsystem have to be modified or rewritten, but the programs of the first subsystem also have to be modified or rewritten. This is because they are tied to the structure of the data base. Consequently, when the second subsystem is completed, it overruns its time and cost estimates by about 20%.

The project manager usually believes he understands how to estimate the third subsystem and includes an inflation of 20%. The anticipated but unknown data

See **DESIGN** page 39

Ruggera is a data processing management consultant based in Fords, N.J.

Honeywell offers HDMS in U.S.

MINNEAPOLIS — Honeywell, Inc. has announced that its Distributed Manufacturing System (HDMS) for the company's DPS 6 line of minicomputers under Honeywell's Gcos MOD 400 or TPS 6 operating systems is now available in the U.S.

According to a spokesman, HDMS operates on-line and is designed to support a variety of manufacturing functions, including long-range planning and daily shop floor control. Developed by Honeywell Information Systems in the UK, HDMS reportedly enables users to integrate their manufacturing systems with office automation and other DPS 6 applications. Key features of HDMS include requirements planning, contract control and material traceability.

HDMS allows requirements planning to run on spare machine capacity to reduce overnight processing loads. This feature reportedly lets users see the immediate results of shop-floor or purchasing activity as updated replanning suggestions.

Using contract identification of work and purchase orders, HDMS relates the cost of all activities to their appropriate contracts. The integration of job costing with the production planning function is said to enable the system to determine the remaining work on a contract and the cost of completion.

The system's material traceability features allow it to maintain the identity of individual material batches and record the subsequent use of each batch in manufacturing operations.

Other features include bill of materials, inventory control, sales order recording, purchase order recording, work order control and master scheduling functions. The system is priced at $55,000 for a one-time license. The price includes one year of support, training and installation.

Honeywell is located at Honeywell Plaza, Minneapolis, Minn. 55408.

DEC adds voice messaging options to All-In-One system

Tools automatically notify users of messages, allow telephone access; OA options offered

MAYNARD, Mass. — Digital Equipment Corp. has broadened its All-In-One Office and Information System software with the addition of voice messaging options and support for several other optional office automation products.

The two voice products — Dectalk Mail Access and Voice Messaging Support — reportedly allow users of DEC's All-In-One package to access electronic mail messages and other All-In-One documents over any Touch-Tone telephone and receive voice message notification in their All-In-One mailboxes.

According to the company, Dectalk Mail Access permits users to "read" messages or documents stored in their All-In-One filing folders by using their telephones. Users can call an electronic mailbox and listen to electronic messages translated into voice by Dectalk, a text-to-speech voice synthesizer. The telephone can also be used to listen to mail in the user's in-box, select specific messages, delete mail and answer mail. Users can stop, pause, resume or repeat the messages.

Voice Messaging Support is an option that automatically notifies users of voice or text mail through their All-In-One terminals. Information on who sent the message, when it was received and the message length is included in the text. By entering a command, the user's telephone will ring, and the message is delivered.

Dectalk Mail Access software for the All-In-One system is priced at $4,500. All-In-One Voice Messaging Support is available for $7,500. Both products will be available in the spring, the company said.

Along with the voice messaging option, DEC introduced versions of a full-function word processing system for All-In-One and for its VMS operating system. WPS-Plus/VMS Version 1.1 and WPS-Plus/All-In-One are said to include Decmate-style word processing, a scientific and technical character set and equation editing.

Users can delete and insert text to different pages and documents without losing word processing functions, the company said. Letters can be combined with spreadsheets, calendar information and other text created through the All-In-One application and distributed by electronic mail. WPS-Plus/All-In-One is licensed for $4,000. WPS-Plus/VMS is licensed for $6,000. Both products will be available in January. Also announced by DEC:

- Decpage Version 1.1, for VAX computers, reportedly allows text, line drawings and graphics to be printed in one compound document. It will be available in January for $5,000.
- Message Router Version 1.1 is a store-and-forward message transport system for the VAX line

See **DEC** page 49

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SOFTWARE & SERVICES

SYSTEMS SOFTWARE

TRIANGLE SOFTWARE CO.
Prodict 2.0

Triangle Software Co. has introduced Version 2.0 of its Prodict systems utility for IBM mainframes running IBM's VM and MVS operating systems.

According to the vendor, Prodict 2.0 now includes an option that permits users to access data by their assigned job network names.

Context-oriented Help panels have been added to the Structured Programming Facility interface and are said to provide information about the subcommand or function when the help is needed.

Prodict 2.0's control statement reportedly allows users to delete entire sets of jobs by specifying a combination of the job name and wild card characters, the vendor said.

Release 2.0 is available for $8,750.

Triangle Software, Suite 275, 4340 Stevens Creek Blvd., San Jose, Calif. 95129.

EXECUTIVE SUPPORT PRODUCTS, INC.
Aces

Executive Support Products, Inc. has announced an editing system for the Honeywell, Inc. Level 66 DPS 8 series and DPS 88 mainframes.

According to the company, the Aces package was developed for use with the Honeywell 7700 and 7800 series terminals to provide a program and documentation development tool to improve productivity.

Aces reportedly maintains full control over cursor position within the edit screen and recognizes and directly supports most Honeywell file formats, including Ascii, Binary Code Decimal, compressed deck and print formats.

Aces is available for a license fee of $7,900 per CPU.

Executive Support Products, Suite 211, 3901 MacArthur Blvd., Newport Beach, Calif. 92660.

CHAKRA SYSTEMS INTERNATIONAL
Go/38 Release 4.0

Chakra Systems International has introduced Release 4.0 of Go/38, designed to enhance control of the IBM System/38 on-line environment.

Enhancements to the product are said to include a command that allows users to remotely execute commands at any workstation linked into Go, statistical reports designed to identify workstation and program use and a restricted sign-on function that can be used to permit unattended start-ups.

According to the vendor, other enhancements include a list option that reportedly dumps detailed status of active workstations to the printer and simplifies backup procedures.

Go/38 is priced at $3,000, according to the vendor.

Chakra Systems International, 8465 Victoria Drive, Vancouver, B.C., Canada V5P4A8.

BOOLE & BABBAGE, INC.
XPF/Cobol Version 1.1.2

Support for IBM's IMS/VS and MVS/XA has been added to Boole & Babbage, Inc.'s interactive testing and debugging tool for use by Cobol programmers.

XPF/Cobol Version 1.1.2 allows application programmers to monitor and correct programs at their terminals, the vendor said. Other enhancements added to the product allow users to obtain a storage dump after a program abend.

Pricing for XPF/Cobol Version 1.1.2 is $30,000 for the first site, and each additional site costs $22,500.

Boole & Babbage, 510 Oakmead Pkwy., Sunnyvale, Calif. 94086.

PRODUCTIVITY AIDS

DBMS, INC.
Developer Tool Kit

A package of application development products for users of Cullinet Software, Inc.'s IDMS has been announced by DBMS, Inc.

According to a spokesman, the Developer Tool Kit is a package of eight software modules, three of which are currently available.

Online Test is designed for testing Cullinet's ADS/Online dialogs and IDMS-DC Cobol and Assembler programs.

Dictionary Module Editor is a full-screen editor that reportedly allows IDMS users to do on-line edits of Cullinet's Integrated Data Dictionary.

The Dictionary Migrator is designed to simplify migration of systems from testing into production, according to the vendor.

The package sells for $14,900. Users of DBMS's DBA Tool Kit can buy the Developer Tool Kit for $12,500.

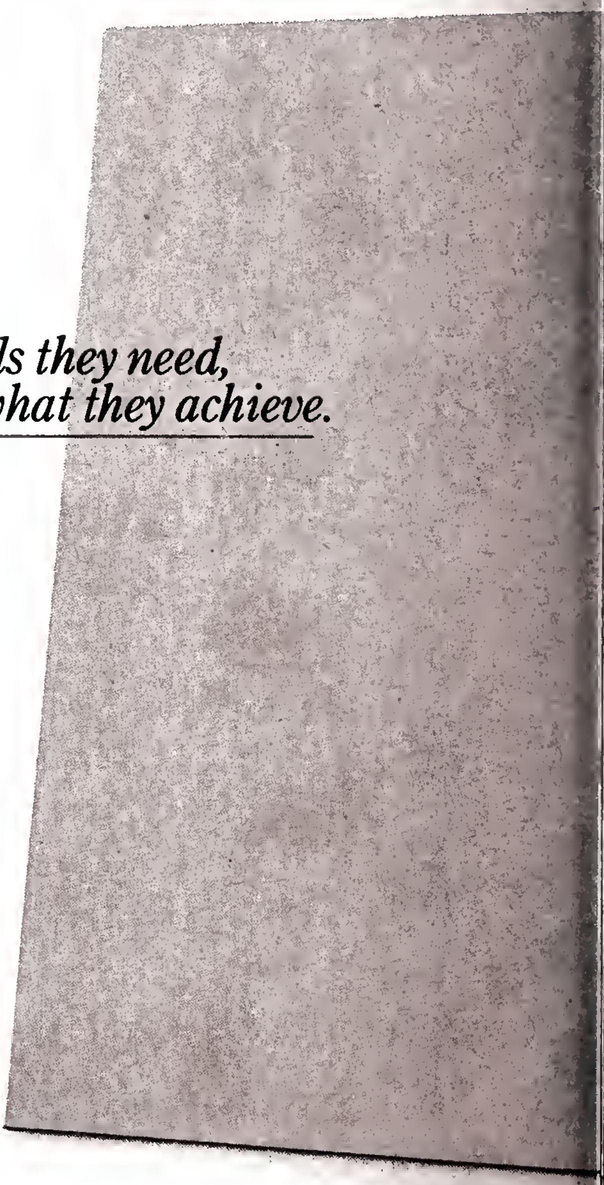
DBMS, 1801 Mill St., Naperville, Ill. 60540.

APPLIED DATA RESEARCH, INC.
ADR/DL

Applied Data Research, Inc. (ADR) has announced that its ADR/DL, an interactive application development system for ADR's Datacom/DB and IBM's IMS data base management system, now allows for Cobol-based application development and maintenance. The package runs on IBM and compatible mainframe computers under IBM's OS and DOS environments.

The new function allows programmers developing and maintaining Cobol applications to access conventional files as well as Datacom/DB and IMS data bases. Existing Cobol programs not originally developed with ADR/DL can also be maintained.

ADR/DL is now compatible with Sketch, the CICS screen painting fa-



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Introducing WordStar 2000, a totally new word processing program from the makers of WordStar.

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From windows, to undo, to spelling correction, WordStar 2000 does it all. And more.

WordStar 2000 gives you the works.

"Windows" allows you to work on different documents—simultaneously. "Undo" lets you replace text you mistakenly removed. A built-in spelling corrector checks and corrects misspellings from over 97% of the most commonly used words.

WordStar 2000 also has a "typewriter mode" to fill in forms or envelopes easily. Plus "format sheets," which give you ready-made headings, tabs and margins at the touch of one key. It can even create and update footnotes.

Finally, a truly integrated word processing system.

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It comes with a built-in five function calculator. A built-in mail merge enables you to mass produce form letters. Get our special Plus package and you also get a built-in mail list data base that allows you to create, update and sort your own mailing lists. Also a built-in indexer. Not to mention built-in telecommunications capabilities.

All integrated together, so you never have to leave the program.

The only word processing program that interacts with you on your level, whatever your level.

Before we created WordStar 2000, we studied the way people worked, and thought. We also drew from our experience with over 1,250,000 WordStar owners.

cility of ADR/Roscoe and ADR/Vollie for OS and DOS respectively.

The permanent license price for ADR/DL is $25,900 for OS environments, $21,300 for DOS environments and $16,000 for IBM Models 4321, 4331, 4361 and 370/115, 370/125, 370/135 and 370/138 or plug-compatibles.

Applied Data Research, Route 206 and Orchard Road, CN-8, Princeton, N.J. 08540.

APPLICATION PACKAGES

SHAWWARE, INC.

Facilities Maintenance Management System

Shawware, Inc. has introduced a facilities maintenance control software system for the IBM System/38 minicomputer.

According to a company spokesman, the Facilities Maintenance Management System consists of seven modules.

These modules include work order management, manpower allocation, equipment management, preventive maintenance, stores' inventory control, purchase order management and accounts payable.

The modules can be purchased separately or together as the fully integrated Maintenance Management System.

Prices for the software range from $10,000 for a single module to $80,000 for the complete system, the spokesman said.

Shawware, Suite 2J, 2075 S.W. 1st Ave., Portland, Ore. 97201.

VERSATEC

Versaplot Color Random software

Versatec, a Xerox Corp. company, has introduced plotting software to support electrostatic color plotting with Prime Computer, Inc. computers running under Prime's Primos 19.2 operating system. The software is used in conjunction with the Versatec Random Element Processor and Versatec electrostatic color plotter.

The Versaplot Color Random software supports 16- or 32-bit integer mode, allowing a 16-bit host to produce up to 13.65-ft-long plots and a 32-bit host to produce up to 40-in.-wide plots of virtually any length, the vendor said. The plotting software provides for eight line colors, 256 predefined area colors and 256 user-definable colors. The software also supports black-and-white plotting, Versatec said.

The price of the Versaplot Color Random software for Prime computers is $4,000.

Versatec, 2710 Walsh Ave., Santa Clara, Calif. 95051.

HERITAGE COMPUTER CORP.

Business Oriented Support System

Heritage Computer Corp. (HCC) has released inquiry software for the property and casualty insurance industry. The software is a supplement to HCC's property and casualty software products and runs on IBM 30 and 4300 series computers under IBM's DOS, OS or MVS operating systems.

The Business Oriented Support System (Boss) was designed to give executives direct control of the corporate data base without any data processing knowledge, the vendor said.

Users can formulate questions either against the data base through a series of menu choices or by using a series of tutorial screens.

Boss will be available at the end of first quarter of 1985. Pricing starts at $50,000.

HCC, 2800 S. Taylor Drive, Sheboygan, Wis. 53081.

DATA PROCESSING DESIGN, INC.

Word-11

Data Processing Design, Inc. has announced that its Word-11 word processing software now interfaces with the Hewlett-Packard Co. Laserjet printer and the Xerox Corp. 2700 Distributed Electronic Printer. The software runs on Digital Equipment Corp. computers under DEC's VMS, RSTS/E, RSX-11M and P/OS.

With laser printers, the user can choose multiple fonts on a single page without stopping the printer. Word-11's spooled printing allows users to share printers, and users can continue to create or edit while other documents are printing.

Word-11 for the Professional 350 costs $795, and prices for larger machines range from $6,000 to $9,500, depending upon configuration.

Data Processing Design, 1400 N. Brasher, Anaheim, Calif. 92807.

DATA PROCESSING DESIGN, INC.

Figure Module in Graphics-11

Data Processing Design, Inc. has added a two-dimensional drawing module to its Graphics-11 software that runs on Digital Equipment Corp. processors under DEC's VMS and RSTS/E operating systems. Figure requires either DEC VT125 or VT240 series terminals.

According to a company spokesman, the Figure module enables users to create and edit graphics images and then receive hard-copy output from printers, plotters or 35mm slide generators. Objects can be moved, scaled or copied to create almost any graphics image needed for business applications, the vendor said. Colors, patterns and text can be added to enhance the illustration.

The price of the module ranges from $2,000 for a DEC Micro-11 to $3,500 for a VAX-11/780, and the Graphics-11 package, including Figure, ranges from $3,200 to $5,600, depending upon host configuration.

Data Processing Design, 1400 N. Brasher, Anaheim, Calif. 92807.

As a result, the keys you press are the keys you'd expect to press ("c" for copy, "p" for print, etc.). You may also use your computer's function keys. Menus have been uniquely designed for easy access to all functions. And MicroPro's exclusive "tutor-in-your-computer™" makes learning fast and fun.

WordStar 2000 is the easy word processing program you'll never outgrow. Of course, the original WordStar and WordStar for PCjr will continue to provide substantial and proven word processing capability for those with more modest budgets.

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Current WordStar owners can upgrade to WordStar 2000 quickly and easily through their dealer, or by calling MicroPro Customer Update (800) 227-5609, 9am-3pm P.S.T.

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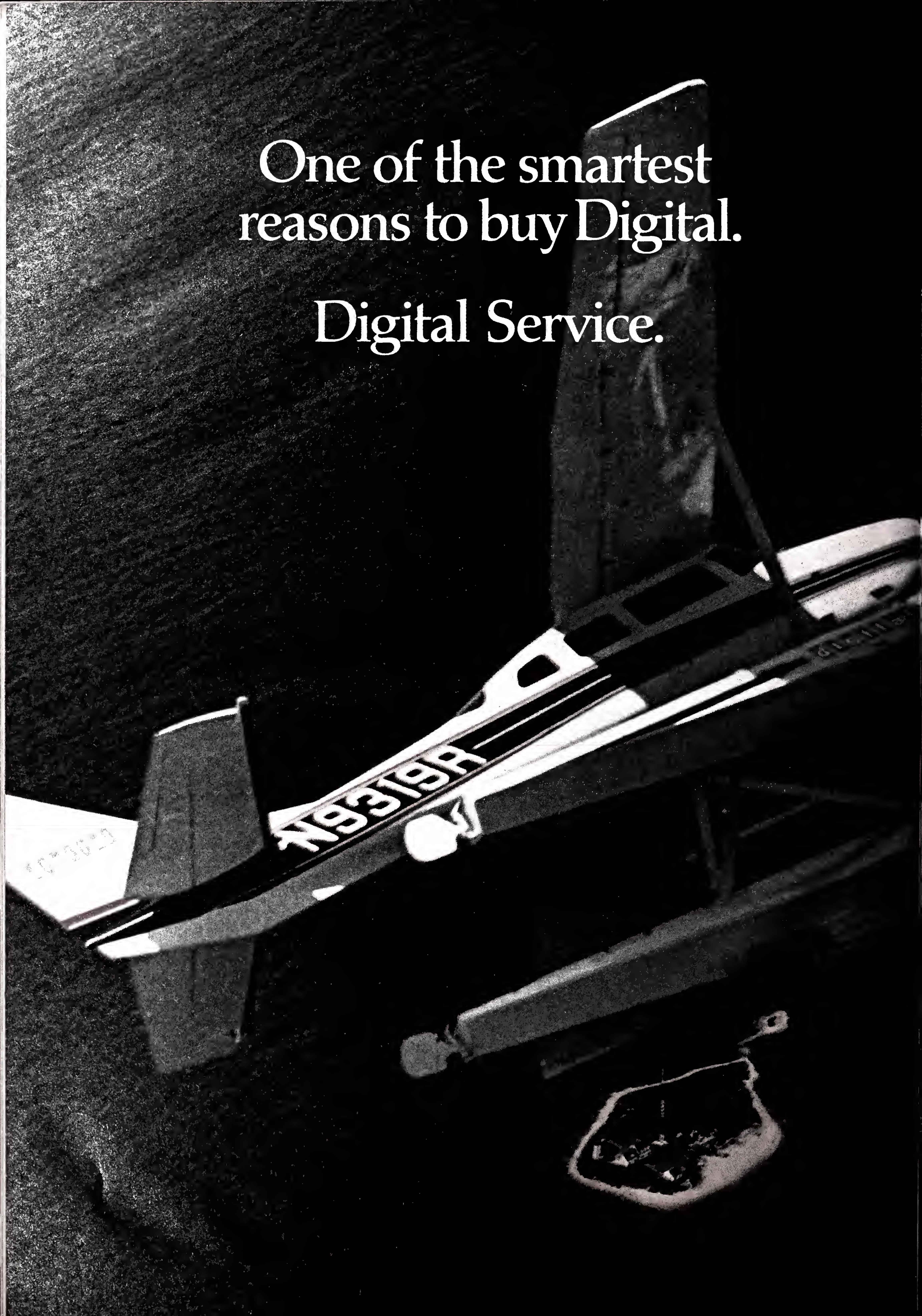
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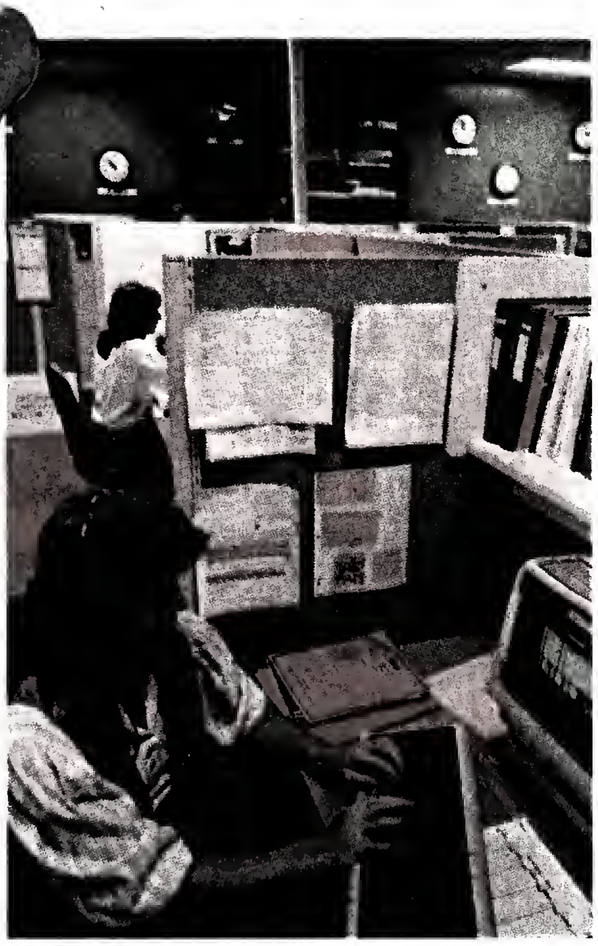

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LINK

from page 41

formed his preliminary close in the traditional manner. A big block of paper has been printed out in multiple copies, and he is evaluating his performance to budget for the month. He has some final adjusting entries to make, errors to clear up and he is under pressure from his board to produce the numbers for an important meeting in two days.

The controller needs to be able to call up the journal entry screens from his personal computer, enter his adjusting transactions, post them in real time to the production data bases and bring this updated data down again to the personal computer to see the results. With a micro-mainframe link that allows real-time update, he can do this in a few minutes.

Real-time uploads are going to become more common as available products improve. But this evolution should have the user thinking about security in terms of uploads as well as downloads and real-time access to production data bases. Do not expect too much from the mainframe software packages in terms of security. Internal procedures are still going to have to play the major part.

Once an end user has proprietary data on his micro, there is little the mainframe software package can do about security. It is up to you to institute rules like locking offices, enforcing procedures of three generations of backup on the personal computer files, using data encryption software on the personal computer and insuring the computers and the data. However, personal computer link software can do something about security. Because the links generally treat the micros as terminals, the user should be aware of some of the important options that should be available.

■ Does the package have security at the level of the data base and at the terminal or personal computer? Is there a feature for user identification and user password? Is there security at the record, field or partial field level? These are some of the levels of security that a comprehensive personal computer link software package should have.

■ Can each personal computer be secured by its location, by the time of day and the days of the week that it can access certain data and for periods of time to handle temporary assignments or project situations?

■ A security log is also important. This is a set of records, built by the software, that allows an on-line display of anyone who has been attempting to violate the security system by getting into unauthorized data and includes information such as which data base and what functions, the personnel and terminal ID and the date and time.

■ Another good feature for security users is providing the ability for the end user to change his own password although not necessarily to add new passwords.

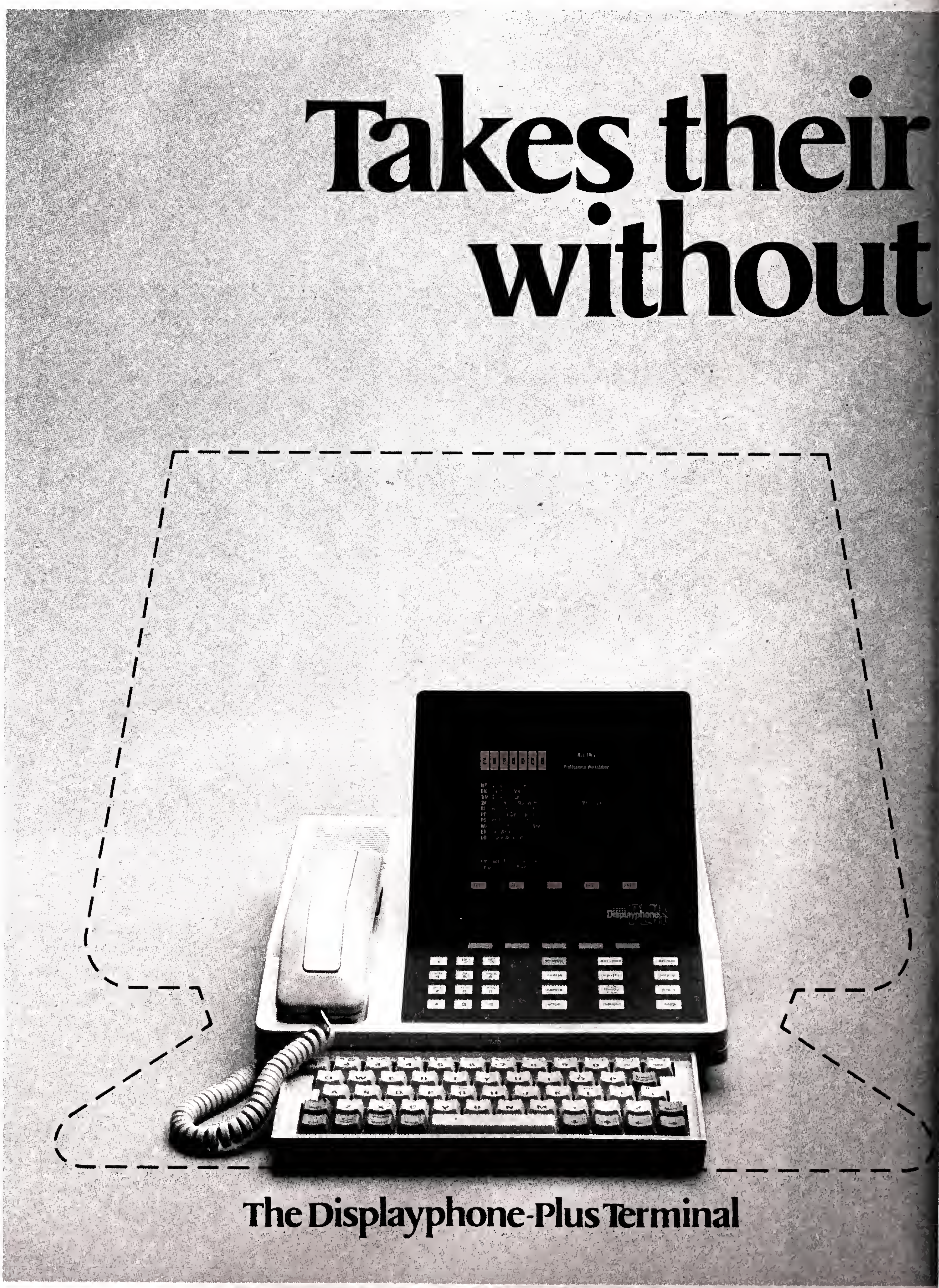
■ Look for the ability to get security interactively in real time. This can be important when a problem employee has been terminated, and there is a need to eliminate his password before he goes back to his office and does some last-day damage to the system.

Another basic philosophy that should be in the software is the concept of two profiles of users, one each for download and upload. In other words, all of these things should be definable in one way for download or data access but in another way for upload or data update, for each individual user.

For example, only our financial vice-president has upload and update capability to the budget fields of a general ledger. But each end user can access his own budget data for download purposes.

Look back at the example of the controller updating a mainframe data base. Security features in personal computer links work like this: First, he can only update his defined data base from his defined personal computer, and he must use his ID and password. Then, he can only get at current amount figures; he only has this capability for a couple of days at the end of the month. The data security function handles the setting of all those security levels.

Being aware of the security risks involved is half the battle. But it is a battle that is easily won when the user supports the new technology with a structured security plan.



DESIGN from page 41

requirement changes occur after which the schema and the subschemas are changed. Then the programs in the first and the second subsystems have to be modified or rewritten. When the third subsystem is finally finished, it overruns the inflated estimate by 20%. Why?

The above scenario is by no means fictional. What happens is the time required to complete each subsystem grows quadratically. This is because the time required to modify each of the previous subsystems is a linear percentage of the initial development effort. As each new subsystem is added, the number of subsystems that has to be modified, as well as the number of interactions, increases.

By using the data base navigation techniques discussed in the accompanying article, the percentage of development time required to modify the previous subsystems can be greatly reduced. What is also desired is the elimination of the quadratic growth in its entirety. This is achievable if the other subsystems can be insulated from the impact of changes in the data base. The key to providing this insulation is the subschemas.

The process works like this. First of all, do not try to design a data base in the beginning that encompasses all the subsystems anticipated in the final system. Besides being a futile effort, the reduction in initial system analysis time will make possible earlier delivery on the first subsystem.

Analyze the data requirements and design a data base schema only for the first subsystem. Write and implement the schema and any subschemas that this subsystem requires. Finally, write and implement the programs this subsystem requires using the techniques discussed in the previous two sections.

When the time comes to build the second subsystem, perform an analysis of its data requirements. If this subsystem is an independent extension of the first subsystem, its data requirements will be an extension of the schema designed for the first subsystem.

Combine the data requirements for the second subsystem with the existing schema for the first subsystem. A large number of the data elements will already exist in the schema for the first subsystem.

Write a new schema for the integrated data requirements. Regenerate the subschemas from the first subsystem to use the new schema. Write the subschemas for the second subsystem. These subschemas should only include the data elements specifically required by the second subsystem.

Finally, write the programs for the second subsystem using the integrated data base.

This process is repeated for each of the succeeding subsystems. The steps to implement each subsystem are the same: Expand the schema, regenerate the subschemas of the previous subsystems to use the new schema, write the subschema for the new subsystems including only the data elements required for that subsystem, and write the programs for the new subsystem using its subschemas.

DEC from page 41

that is said to optimize message delivery. It includes existing standard support for network protocols. The product reportedly gives users the ability to log progress of messages within the network and provides VMSmail gateways for accessing DEC's VMS Personal Mail Utility. Message Router sells for $4,000 and will be available in the spring, DEC said.

■ Decspell Version 1.1 includes expanded lexicons and compatibility with the All-In-One system. The product reportedly includes correction capability for documents created with the WPS-Plus/VMS. It will licensed for $1,850 and will be available in January.

■ Decslide Version 1.3 is said to allow VAX/VMS and MicroVMS users to create slides containing text and graphics. The new version includes compound document capabilities. Decslide is priced at $2,500 and is available immediately.

■ Decgraph Version 1.3 is a general-purpose graphics package for VAX computers and MicroVMS systems. The product is priced at $2,500 and is available immediately.

DEC is located at 146 Main St., Maynard, Mass. 01754.

terminal's place the space.

It's important that the Displayphone-Plus* terminal can fit with an existing information management system, offering download emulation of virtually any cursor addressing conversational CRT and plug-and-play compatibility with the VT-100.

But what makes the Displayphone-Plus amazing is that it does it all while still fitting comfortably on a desk.

Inside the Displayphone-Plus terminal is a 212A compatible auto answer modem with selectable 300/1200 BPS transmission rates and full automatic log-on. So it can meet the needs of managers and other occasional data users, while emulating such terminals as the Digital Equipment Corporation VT-100™ and VT-52,™ ADDS Viewpoint,® Regent 25,® and many more.

On the outside is a full-stroke keyboard and easy-to-read amber screen which allows the Displayphone-Plus terminal to match the performance of large, conventional terminals. Its sophisticated telephone capabilities allow it to surpass them with a 90-number directory, automatic dialing, and handsfree speaking. And it's as easy as a telephone to use.

To find out more about the Displayphone-Plus terminal, call 1-800-328-8800, or write to Northern Telecom Inc., Advanced Communications Terminals Division, P.O. Box 202048, Dallas, TX 75220-9990.

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Four-Phase is helping more than 2,000 DP managers win the productivity game.

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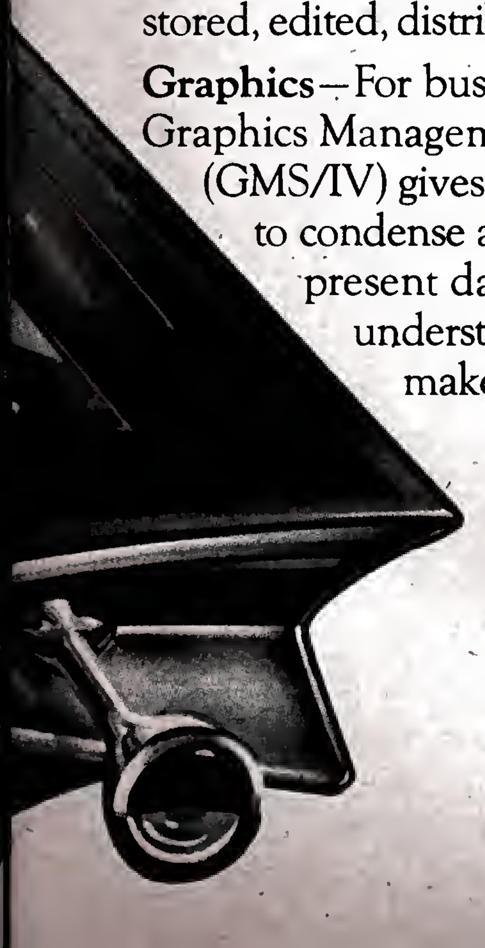

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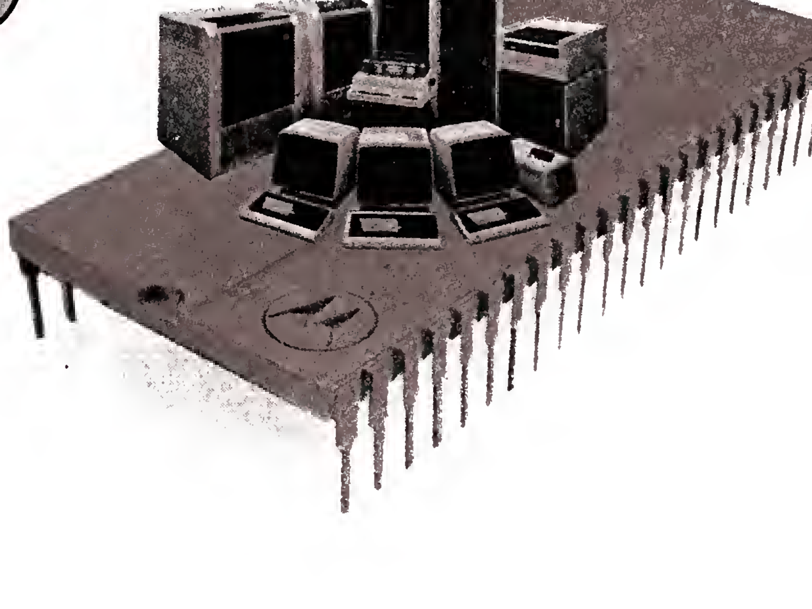

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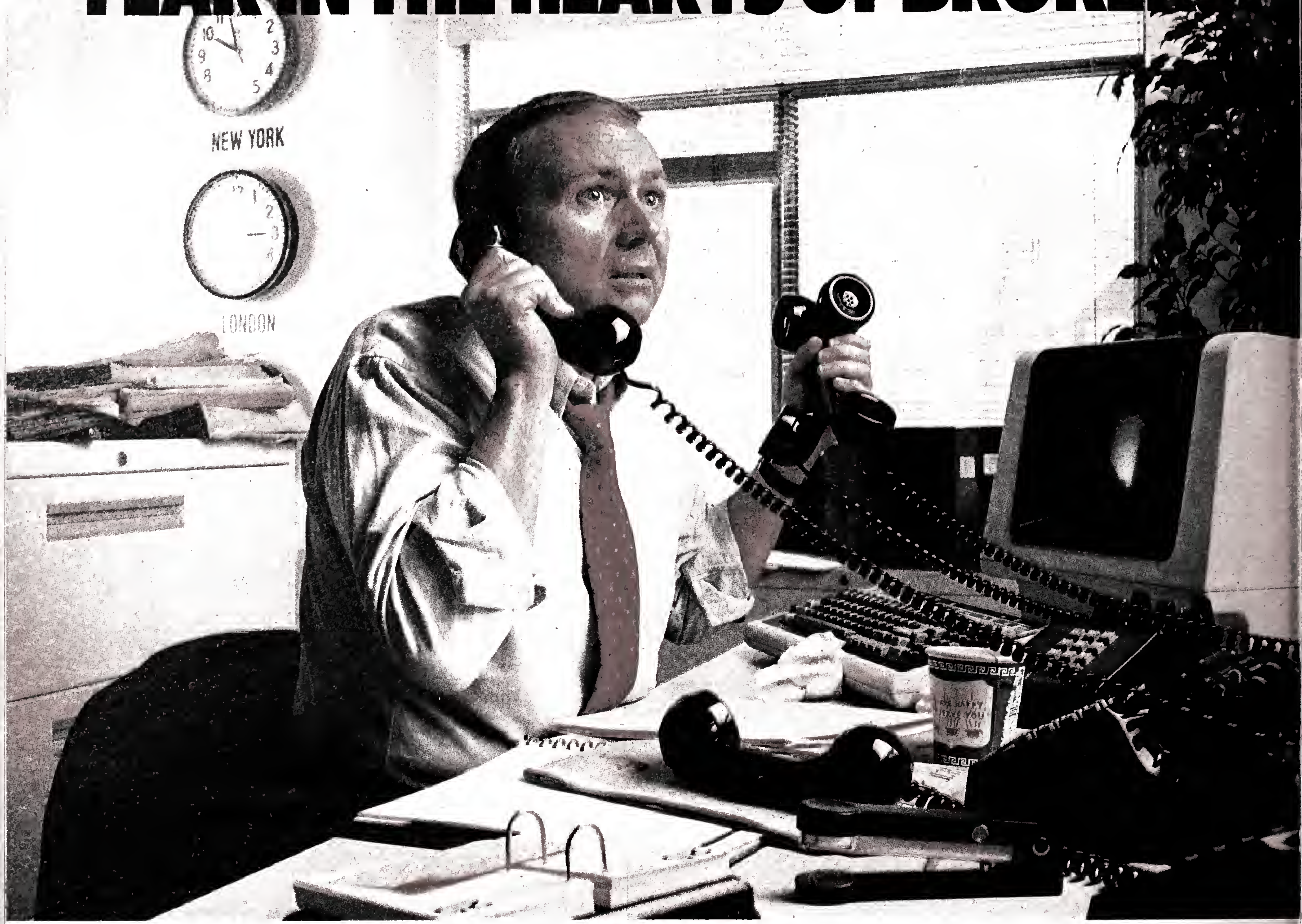
FOUR LITTLE WORDS THAT STRIKE FEAR IN THE HEARTS OF BROKERS



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COMMUNICATIONS

INSIDE
Controllers/**56**

Dual-port muxes help users cope with cable woes

By Jeffry Beeler
CW West Coast Bureau

SAN FRANCISCO — Members of the San Francisco Police Department's Gang Task Force were beginning to get a little edgy.

For some time, the task force had sought to install an IBM 3287 printer in its fifth-floor, downtown administrative control center. The printer was earmarked to be located with an existing CRT terminal that the police use to receive administrative messages from around the state.

But the installation, though seemingly routine, hit a snag: Because the task force lacked the necessary coaxial cable, it was unable to connect the newly acquired printer to its existing hardware.

So the police approached the city's Department of Public Works (DPW) and asked that an additional coaxial cable be strung between their first-floor IBM 3274 controller and the printer. But the DPW, with its job order backlog already lengthy, was unable to respond promptly.

In fact, the delay in pulling the desired coaxial cable probably would have ranged from one to two months, according to John Barr, DP manager at the City of San Francisco's Hall of Justice.

News of the extended lead time reached the local police chief, whose reaction was less than sympathetic. Police Sgt. Bill Shoaf explained that the chief, in a memo to the Gang Task Force, said, in effect, "I know there are a hundred reasons why you can't do it. Just get it done."

One day later, a task force member spied a newspaper ad extolling the virtues of a modest-looking communications accessory that allows two I/O devices to be run from the same coaxial cable. The accessories, dual-port coaxial multiplexers, were developed by Fibronics International, Inc., a Hyannis, Mass.-based fiber-optics communications company.

Intrigued and desperate, the task force decided to try the coaxial doublers. Within 15 minutes of their arrival, two were fully installed and were allowing a shared coaxial cable to support both the IBM printer and its companion terminal, Barr recalled.

See **DOUBLERS** page 56

Southwestern Bell to expand digital transmission services

ST. LOUIS — Southwestern Bell Telephone Co., noting that a third of the customers who are bypassing the company do not know that it offers services they need, has announced a series of digital transmission services.

Tariffs for some of the Digital Link Services, including Megalink and Microlink, will be filed in Kansas, Arkansas, Oklahoma, Missouri and Texas in the next several months and in other states in 1986, according to the Southwestern Bell Corp. subsidiary.

"Our own research indicates that about a third of the customers who bypassed us didn't know we could have provided the network services they needed. Too many customers think we only provide plain old phone service.

"But our business is moving information — voice, data and video," said James W. Callaway, vice-president of marketing for Southwestern Bell Telephone.

Callaway said digital transmission throughout the region will be enhanced by installation within the next two years of at least 32 new digital switching systems serving up to 450,000 customer lines. The company now has 27 digital switching systems serving 95,000 lines.

Dedicated data lines

The Megalink services, designed for customers needing dedicated data lines, include Megalink I-Standard Digital Service, Megalink II-Premium Digital Service and Megalink III-Wideband Digital Service/ 1.54Mbps.

Megalink I and Megalink II, the latter of which is currently offered under the name of Dataphone Digital Service, offer transmission speeds up to 56K bit/sec. Megalink II will feature 24-hour monitoring and 99.5% accuracy, according to the company.

Megalink III, featuring a 1.54M bit/sec transmission rate, was designed for high volumes of data, voice, video, electronic mail, facsimile and other services.

Microlink I-Public Switched Digital Service and Microlink II-Packet-Switched Digital Service are targeted at businesses and residential customers who transmit data less frequently.

Microlink I provides dial-up digital transmission on the established telephone network using a digital link between the computer and telephone line.

The tariffs for that service will be filed in 1986.

Microlink II will allow various customers to transmit packets over the same lines and save money by only paying for their own usage.

The Microlink II tariffs will be filed in 1985.

Tymnet plans Japanese net

SAN JOSE, Calif. — Tymnet, Inc. has announced a joint venture that it hopes will lead to the establishment of a value-added network throughout Japan.

Tymnet, a packet-switching network, said the joint venture with the Tokyo-based Marubeni trading company will become effective April 1, when the firms expect approval of a proposed telecommunications bill in the Japanese parliament that would allow private companies to offer value-added network services.

A Tymnet spokesman said that all of the value-added services that Tymnet offers in the U.S. will be available through the Japanese network.

Much hardware, software installed

The spokesman said the venture, Japan Network Ltd., will use Tymnet hardware and software, much of which already has been installed.

The network initially will support the cities of Osaka, Tokyo, Sendai, Nagoya, Fukui, Kanazawa and Toyama.

It also will connect to the Tymnet network in the U.S. and other worldwide public data networks, according to Tymnet.

There are 22 secondary shareholders in the joint venture.

Reagan position on Intelsat competition may be moot

DATA STREAM
James Connolly
CW Senior Editor

The Reagan administration's approval of limited private competition for the International Telecommunications Satellite Organization (Intelsat) may be good news for Intelsat's potential rivals.

But the president's action may have little influence on what already seemed to be developing as a buyer's market in international communications. Even before the president issued his memorandum to the secretaries of state and commerce, communications industry observers were predicting drastic price cuts for intercontinental traffic because Intelsat overestimated demand for its transponder space, and terrestrial transmissions are increasingly available as an option.

The administration said it will allow the five private rivals of Intelsat to fight for up to 15% of Intelsat's U.S.-based data, video and intracompany voice traffic. Those rivals are Orion Satellite Corp.; International Satellite, Inc.; Pan American Satellite Corp.; Cygnus Satellite Corp.; and RCA Americom, a subsidiary of RCA Corp.

Unanswered question

However, one question that remains unanswered is how soon, and under what conditions, those companies that last year asked the Federal Communications Commission for permission to compete with Intelsat can get into the satellite market. Reagan said that those who compete with Intelsat must consult with Intelsat about their plans, that they cannot offer switched public circuits and that they must meet the technical compatibility standards of regulating bodies in the countries they plan to service.

Fritz Ringling, director of telecommunications research for the Gartner Group, Inc. in Stamford, Conn., speculated that RCA and Orion are most serious about offering satellite services.

"I anticipated that the administration would allow private satellite companies to compete with Intelsat. I also anticipate very agressive pricing strategies, which could mean significant savings for customers," Ringling said.

Ringling said one reason for the lower prices is the current and future lack of demand for transponder space. He said Intelsat overestimated the need for circuits by 15%, "which translates into 12,000 voice-grade circuits." He observed that even the National Aeronautics and Space Administration has predicted a 10.3% decline in the growth of full-time satellite traffic. He added that the U.S. International Service Carriers last year revised downward their estimates for satel-

See **INTELSAT** page 56

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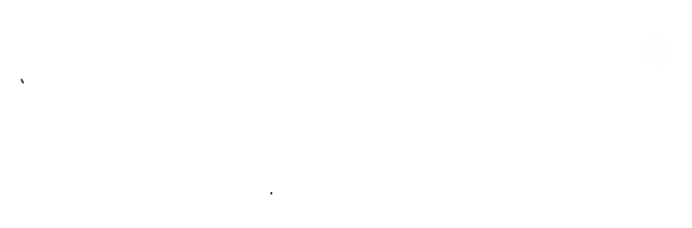

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CONVERTING TO IBM?

Based on previous success and popular demand, Touche Ross & Co. is hosting another conference for companies converting from non-IBM computer environments to IBM.

The purpose of the conference is to provide a forum for participating companies to exchange ideas and share experience. All participating companies will be asked to make informal presentations and participate in breakout groups. Touche Ross will act as conference host and moderator.

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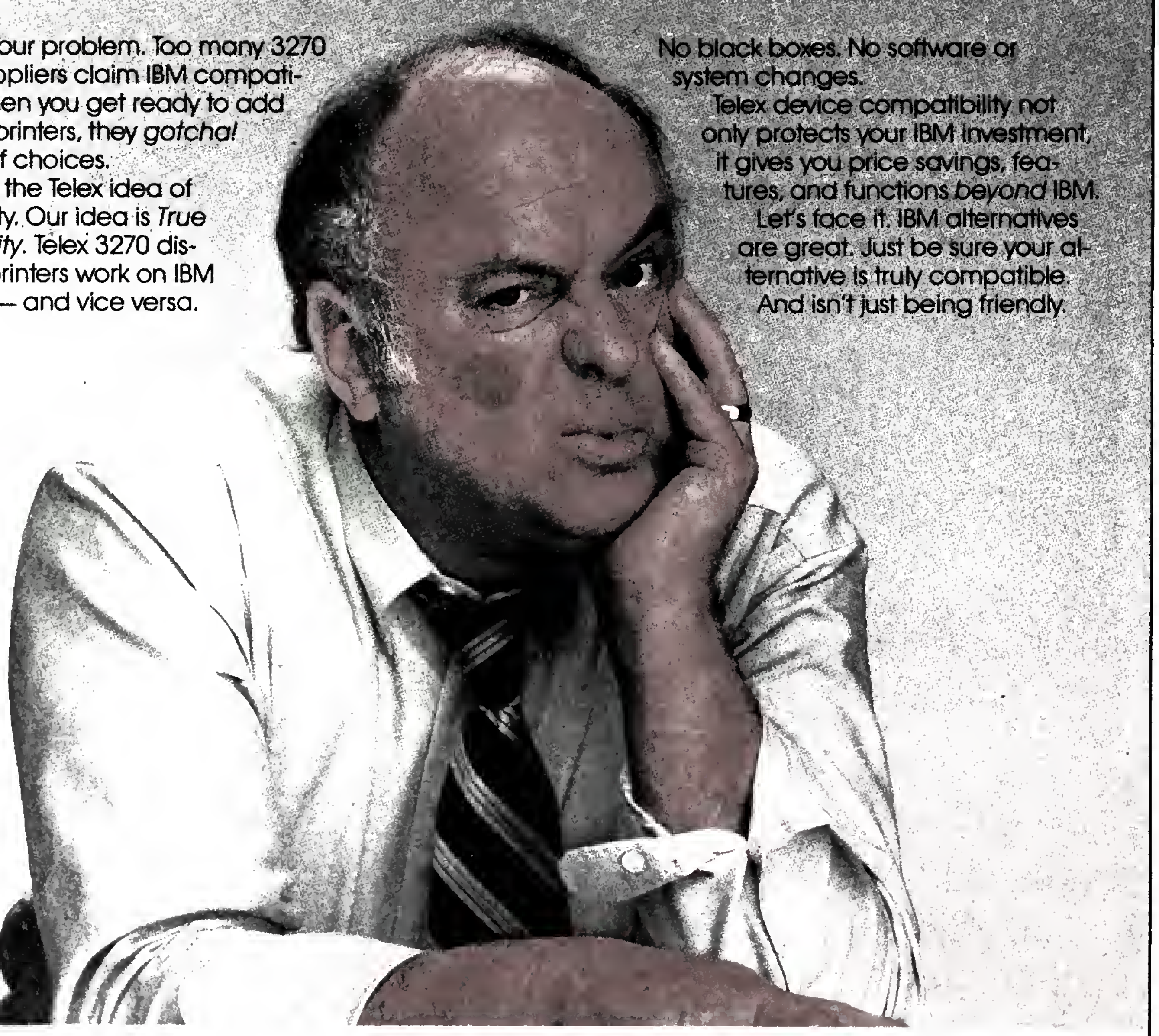

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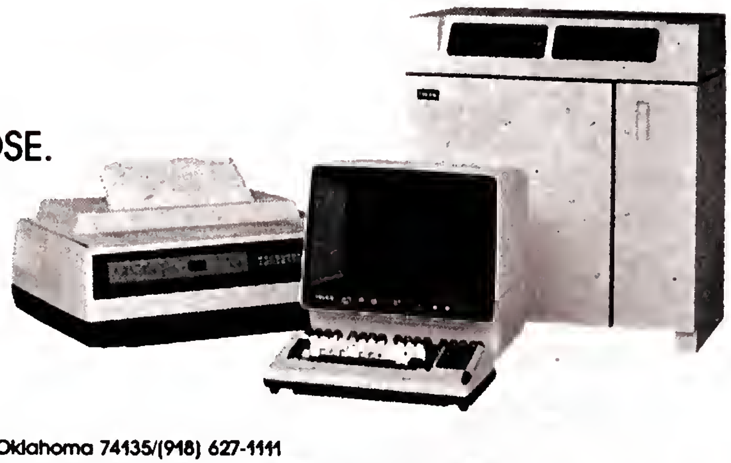

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COMMUNICATIONS

CONTROLLERS

EMULEX CORP.

Commxchange

Emulex Corp. has announced a data switch that is said to allow connection of 180 terminals to single- or multiple-host computer networks.

Commxchange, also called the DS01, reportedly supports 180 terminal-to-computer port connections, or 360 lines, and can be expanded for an additional 480 connections, or 960 lines.

According to the vendor, the Commxchange is compatible with virtually any type of computer or asynchronous terminal, and performance is unaffected as the number of users increases.

The basic system includes a central unit, power supply and central board set. The backplane reportedly is fully redundant, while redundant central boards, expansion bus boards and power supplies can be added as options. It also features a standard battery backup to ensure saving configuration parameters in the event of a power failure.

The company said installation can be handled by a maintenance department or telephone installation crew. It connects through ordinary telephone lines and connectors using a variety of methods, such as telephone punch blocks, telephone jacks, 50-pin connectors and RS-232 distribution panels.

A supervisory control board in the central unit provides menu-driven software for step-by-step instructions on routing terminal lines to designated computers, according to Emulex. A terminal reportedly can select any of 45 types of destinations by using eight-character symbolic names or specific line numbers.

The unit is said to support speeds up to 9.6K bit/sec on all lines.

The company said a typical unit, with redundant power supplies and board sets, costs $15,000.

Emulex, 3545 Harbor Blvd., Costa Mesa, Calif. 92626.

DOUBLERS

from page 53

The Gang Task Force's recent case history is by no means unique, according to Fibronics product manager Dave Sonderegger. He said that in hundreds of large businesses and other organizations throughout the U.S., dual-port coaxial multiplexers are providing users with a quick-fix alternative to the often costly and time-consuming practice of installing additional cable.

The motivation for installing the communications accessories varies widely.

Some users — the San Francisco Police Department's Gang Task Force, for example — opt for the devices to avoid lengthy delays in pulling coaxial cable. Other users, including the I Magnin department store chain, see the multiplexers as a means of minimizing their hardware overhead.

Installation of a single coaxial cable frequently costs $1,000 to $1,200, according to Roy Dodd, the chain's operating vice-president for MIS. Two doublers, by contrast, sell for less than $500.

INTELSAT

from page 53

lite circuit demand and that he won't be surprised if they reduce their figures yet again.

While demand is waning, the customer's cost for satellite transmissions also will come down, which could inspire new business applications, according to Ringling and other observers. Ringling noted that the price of earth stations, particularly receive-only stations, is plummeting.

Jerry Lucas, president of the Telestrategies, Inc. consulting group in McLean, Va., predicted that opening up more transponder space, in particular transponders on the underutilized Ku Band, will lead to large companies developing new applications for their satellite links. He said one such application would be downloading software updates to multiple locations around the world.

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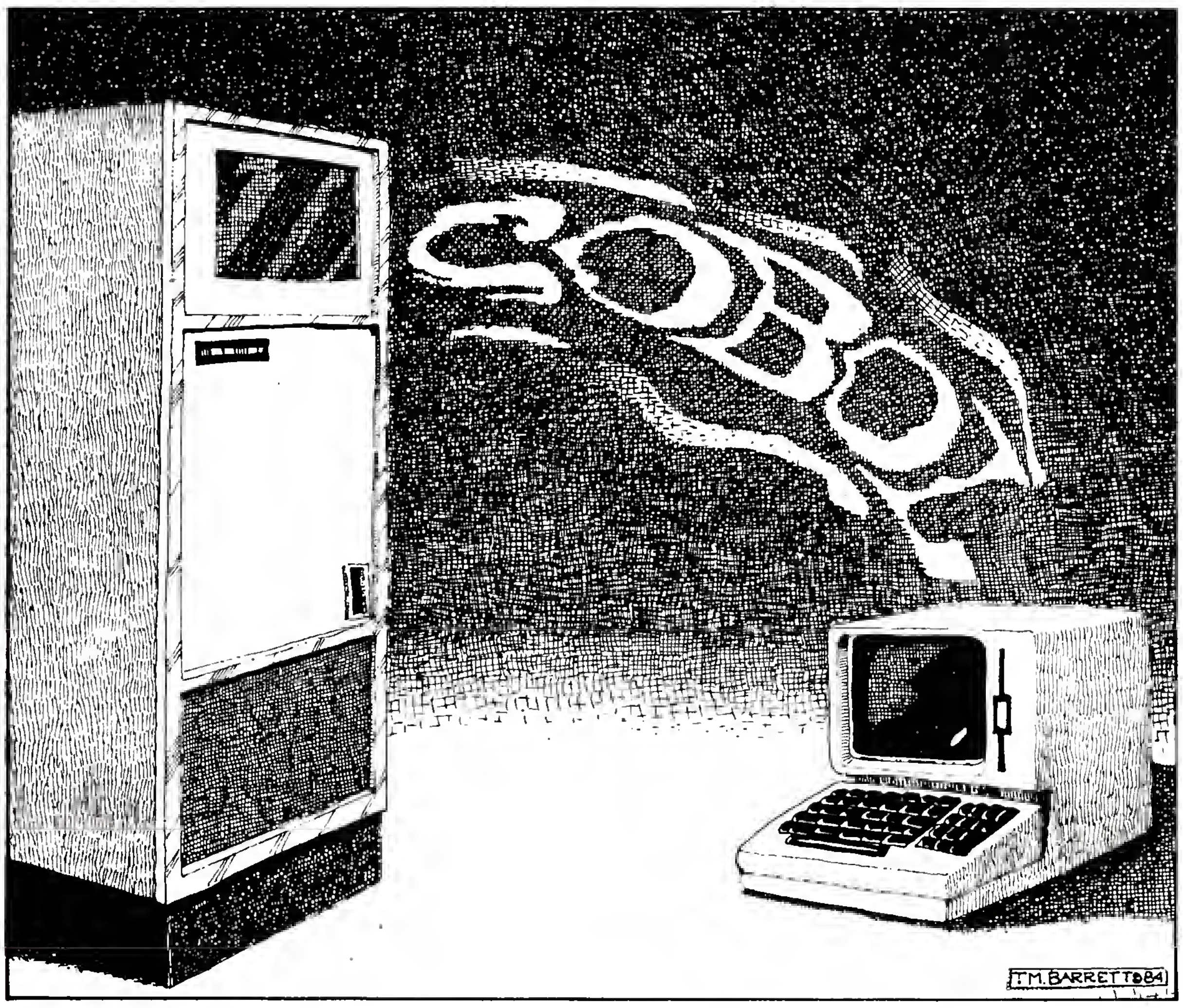


To anyone moving Cobol applications to micros

RESPONSE

The In Depth article "Running your Cobol on micros" by Anthony Fedanzo Jr. [CW, Nov. 19] presented arguments for converting existing mainframe or mini applications to micros. Here are some caveats from a reader who has run Cobol on micros for the last four years.

By Dick Burkhalter

I am not one of the "Cobol haters" who think that Cobol and Cobol programmers should be banished from the planet. Nor am I of the opposite persuasion, praising Cobol above all other languages. I simply view Cobol as another computer language with its own strengths and weaknesses.

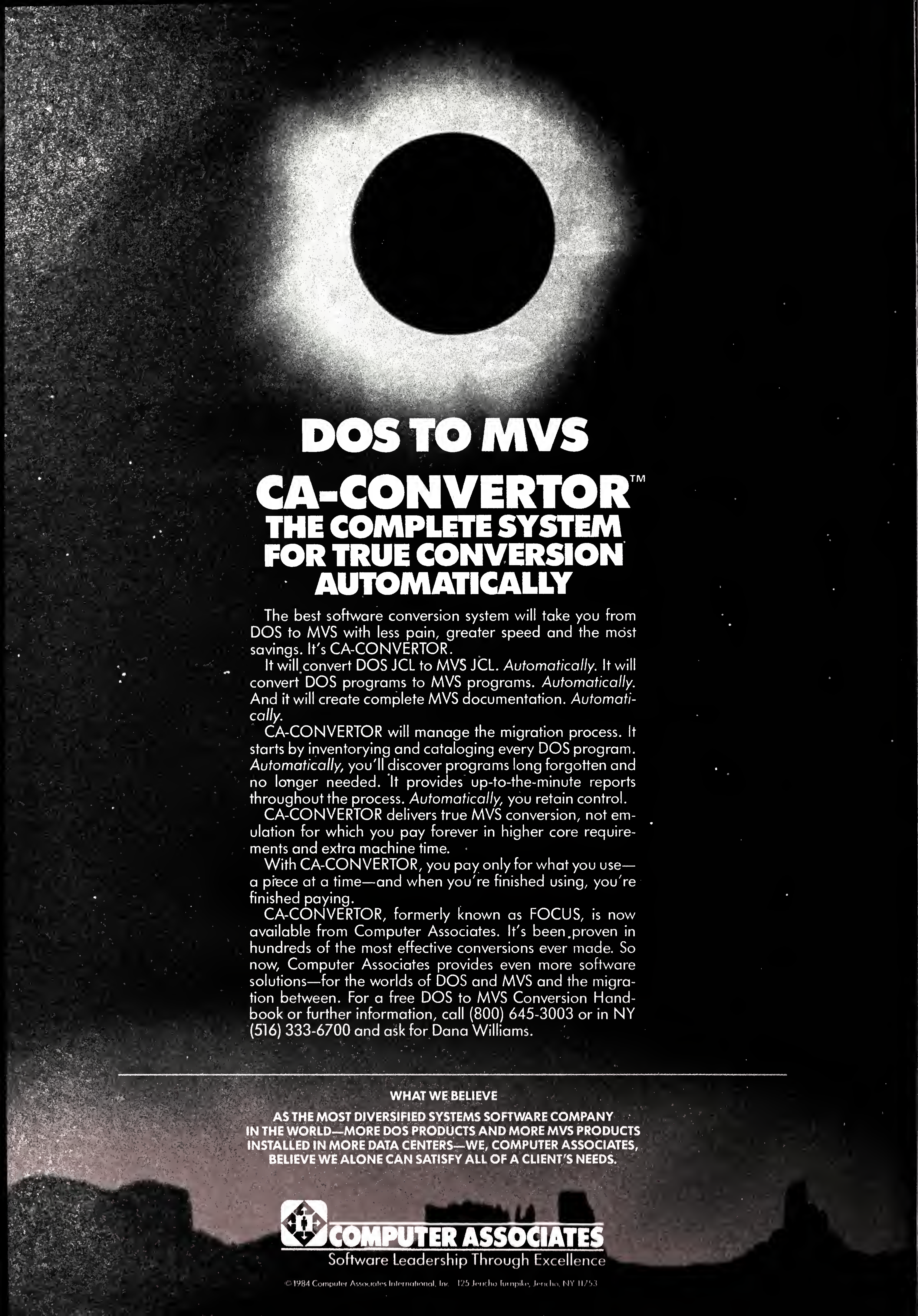
My experience with Cobol on micros is limited to a single product, Ryan-McFarland Corp.'s Cobol compiler. It may be that some of the problems I mention are specific to that particular implementation, and I think it would be valuable to readers to hear from users of other Cobol compilers, such as those from Micro Focus, Inc., Microsoft Corp., Realia, Inc. and others.

I found Fedanzo's article interesting and informative. I do, however, think that he missed some key points (or glossed over them) in relation to the difficulties that might be encountered in moving a Cobol application from a large computer to a micro. I am concerned that readers without extensive personal computer experience may be misled by the article, which portrays the conversion as a relatively simple one.

The problems that may occur in moving Cobol applications fall into four general categories:

1. Problems associated with the incompatibilities in the various implementations of Cobol.
2. Problems caused by the quality of the original Cobol code or efforts to clean it up.
3. Problems resulting from the limitations of microcomputers.
4. Problems in transferring data between mainframes and micros.

Unless you already use Ryan-McFarland's Cobol or Information Processing, Inc.'s Blis/Cobol on your large machine, you cannot get a truly compatible Cobol compiler for your micro, as far as I know. Even with these two products, there may be some differences in implementation that will necessitate rewrites of part



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of your original source code. This is the best case. In the worst case, you may have to rewrite so much of the code that you might as well start from scratch.

Those of you in IBM mainframe environments have a real bear of a problem, because no matter which personal computer Cobol you pick, you may have to rewrite significant portions of the code in transporting it to a personal computer. Yes, I know, all the microcomputer Cobol vendors claim conformance to the Ansi '74 standard, and as far as I can tell, they aren't lying.

However, the standard has a lot of levels, and only in the fine print do you find out what each vendor supports at each level. And, of course, IBM is well known for its own extensions to Cobol, such as Sort and Report Writer. You don't use those? Lucky for you. Maybe.

Fedanzo stated that the most likely candidates for migration to microcomputers are those older batch programs that are used for data entry. Fine. But micros, by definition, are on-line, interactive machines, getting their input from the screen rather than from cards, tapes or whatever. Most old data entry programs I have seen read cards or card images, and the coding necessary to change to screen input is not as trivial as you might first believe, especially if you are going to edit interactively and prompt the operator.

Screen handling

Even if the programs you are converting use screen input, you need to consider the differences in screen handling between your mainframe compiler and whatever product you choose for the micro. If you have an IBM system and use CICS, you can probably expect to throw away about 60% of the code right off the bat. Similar, though perhaps less burdensome, differences will hold true for other mainframe and minicomputer users.

If your mainframe or mini uses a later version of Cobol that supports such nice features as SEARCH, SEARCH ALL, STRING, UNSTRING and other newer verbs, you are going to have to spend a significant amount of time developing subroutines to replace those features, none of which are present in current personal computer Cobol compilers.

Fedanzo recommended making program changes on the mainframe rather than on the personal computer, supposedly to take advantage of the higher speed of processing and better editing facilities inherent in large computers. I dispute that assumption, especially in a large shop with a heavily loaded system.

Using Micropro International Corp.'s Wordstar or any other word processor, a dedicated personal computer can run circles around most mainframe editors, considering the poor response time usually found on large systems during peak hours. Not only that, but the programs must be compiled on the personal computer anyway, so time gained, if any, by editing on the mainframe may be lost in downloading to the personal computer for compilation.

Speaking of compilation, one should be aware of the slowness of compile times on personal computers relative to mainframes. A typical Cobol program on a mainframe might average 2,000 to 3,000 lines of code and compile in less than a minute. In contrast, the compile time on a micro would be measured in portions of an hour or even more. A program this large is truly huge by personal computer standards.

I have a system written in Cobol for a Tandy Corp. TRS-80 Model III. It contains about 40 programs, the smallest of which is less than 200 lines of code and the largest about 1,800 lines, with an average program size of 500 to 600 lines. The small programs compile in three to five minutes, depending on whether I print the source listing during compilation. The larger ones seem to take time, which increases exponentially with the size of the program; that one real biggie takes more than 45 minutes!

Granted, substantial speed improvements will be experienced with 16-bit machines as opposed to the TRS-80's 8-bit processor, but you will still encounter long compile times as the programs increase in size. You cannot compile programs on the mainframe and move only the object code to the personal computer, because the instruction sets and form of the object code are machine-dependent.

Which brings me to yet another trap for the unwary, namely that of the differences in those supposedly "compatible" personal computers. If you have a mix of personal computer brands, which you intend to use as target machines, be absolutely sure that a single copy of the compiler will create usable object code for all of them. It's possible, but be sure to find that out via actual testing before you embark on a large project, or you may find yourself facing

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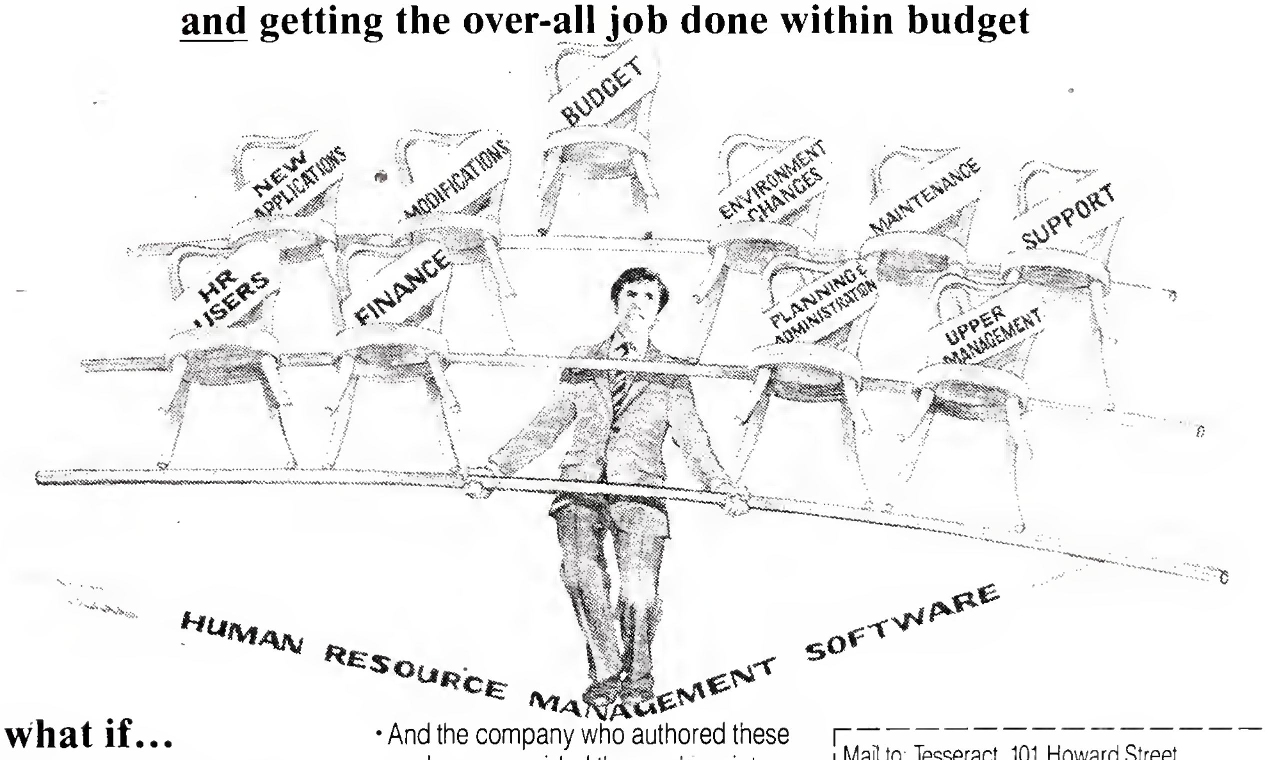

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In the case of the TRS-80 system, separate compilations are required for the Model III and Model I versions, even though the two computers are from the same manufacturer and use the same Zilog, Inc. Z80 CPU. Fortunately, the Cobol compiler package from Tandy (RM Cobol) includes disks for both the Model I and Model III.

If, however, I wish to upgrade my system to run on the Tandy Model 16 or 2000, I will have to purchase a different Cobol compiler for each of these two machines, because they are not compatible with the Model III or with each other.

Quality of Cobol code

One of the most significant issues to be considered is the quality of the programs to be converted. Given that most of the ideal candidates for conversion are likely to be older batch programs written at the Cobol-74 level, it is highly unlikely that these programs were written in structured code.

Moving unstructured code from a mainframe to a personal computer will only move the maintenance headaches from one environment to another, and the latter may be less efficient in terms of maintenance facilities.

If modifying the transported code is to be considered in order to bring about conformance to current structured programming standards, significant delays may be expected. Missing or misleading documentation is common with older programs, and making modifications without totally "gut-ripping" the programs can be difficult. We all know the feelings of frustration that come from wanting to scrap an old program but being forced to make the best of it because of time and cost considerations.

Either way, it is an expensive game to play.

Limitations of micros

Fedanzo mentioned the limitation of 64K bytes of data stack space, which relates to the length of the longest program you may have in memory at a time. This is by far the least restrictive limitation you need be concerned with, because it is often possible to divide a large program into segments or modules that can be called from one another. In some cases, even this technique does not work, however, as portions of the data division that are passed from module to module remain in memory, and eventually you run out of memory, just as in Basic or any other language.

Because you find out about this at development time, during testing, it's not as crucial as finding out after you have put the program into production mode, but the amount of time you have to spend fixing up programs to run in less memory is something to be anticipated.

Another problem here is that you have no way of knowing in advance how much memory a mainframe program will take on a personal computer, because there is no direct correspondence between the size of the program as it runs on your large system and the amount of space it will take when moved over to your micro. You just have to use common sense and try it. (Obviously, you aren't going to try fitting that 20,000-line payroll program into your micro, are you?)

If fitting programs in memory and waiting for compilers to finish are small problems, then fitting all that code onto floppy disks can be a real nightmare. The average personal computer has about 350K to 400K bytes of storage per double-sided, double-density floppy disk. That's not very much storage from the point of view of most mainframe applications. Cobol programs are notoriously verbose and, even at the object-code level, can require more space than is available on a single floppy drive.

Remember, you not only need to have all your programs on a single disk, but that disk must also contain the Cobol runtime modules and the operating system as well. Consideration must be given to this limitation, lest you find yourself in a situation in which the operator is forced to swap program disks in order to run the application — definitely not a user-friendly situation!

Similarly, data files on large systems tend to occupy a lot of space (in personal computer terms). Even if you can segment these files for downloading, you must be aware of your total disk space needs. I can't think of anything much worse than having an "out of disk space" message occur in the middle of a hectic day. Don't laugh, I've had it happen, and so may you, as Murphy's Law reigns supreme in this business.

As far as I'm concerned, hard disk is the only way to go, and the more the better in the corporate environment. This is true regardless of the language being used. The declining cost of hard-disk storage makes this point even more valid. And while you're at it, factor in the cost of a streaming tape backup, because we all know that if the operator has to back up the hard drive to floppies, sitting there feeding backup disks into the personal computer, one by one, backups will be skipped with regularity. (They usually will be taken only on the day after a power failure wipes out all the data captured since the last backup, which may have been weeks earlier.)

Add the price of at least 10M bytes of hard disk and a compatible tape backup device per target machine to your conversion cost.

Data format incompatibilities

Regardless of how easy or difficult it may be to convert program code, you must be aware that the data format incompatibilities between mainframes and micros present a bigger burden than Fedanzo suggested. Moving source code files presents no special problems, because these are simply Ascii text files.

However, there is currently no way to transfer random or indexed files directly (and what good is a Cobol program if it doesn't use Isam files?). Programs will have to be

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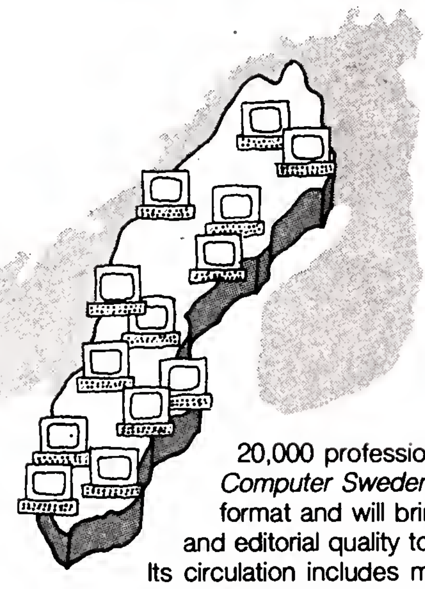

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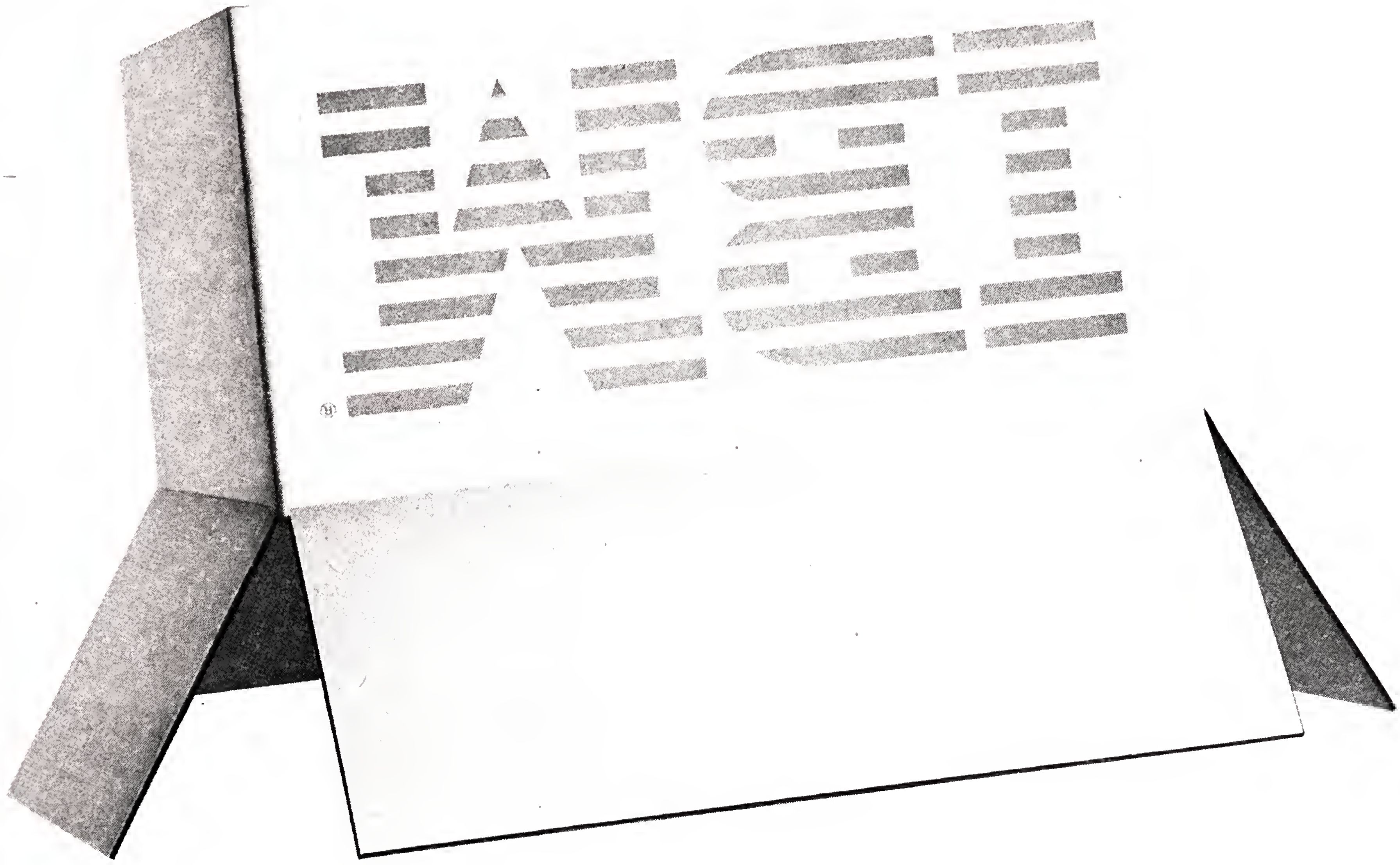

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written to extract sequential files on one side and read and load the indexed or random files sequentially on the other.

In the worst case, programs may be required to perform both operations on both sides. While the time to write these programs may be trivial, the time it takes to load indexed files on a micro can be agonizingly long if more than a few hundred records are involved.

This slowness will be magnified to alarming levels if the micro uses floppy disks rather than hard disk. It will take hours, not minutes, to load a reasonably sized Isam file from sequential input.

To summarize, then, while it is possible to convert programs from mainframe to personal computer using Cobol code, it is not at all as simple as it appears on the surface. Obviously, Fedanzo has done it successfully, and with the right mix of hardware, compiler and application software, so can you. But I would advise doing an in-depth study of all the factors mentioned here before proceeding.

In fact, it might be worthwhile to invest in a number of Cobol compilers for the target microcomputer and try your luck with all of them using some relatively small and noncritical system as a testing and learning tool before proceeding to bigger things. The cost of compilers is small compared with the total development effort likely to be involved.

Additional considerations

Given that the idea of moving some applications from a mainframe to a personal computer is valid in many cases, I would suggest that you consider using one of the personal computer data base management systems, such as Ashton-Tate's Dbase II or III or Microrim, Inc.'s R:Base, instead of Cobol to generate the micro application.

These products are easier to learn and use than Basic, Pascal, C or other languages which are so adored by the micro gurus. Any competent Cobol programmer should become proficient with any of them in less than a week. Not only that, but the resulting application may be cleaner and friendlier to the user than something hacked up out of old Cobol code.

It is highly likely that writing the application over using one of these micro products will require less time than converting the Cobol code, even allowing for programmer learning curves. Additional benefits may accrue from the ability to create additional reports or screens quickly using the facilities inherent in the personal computer product.

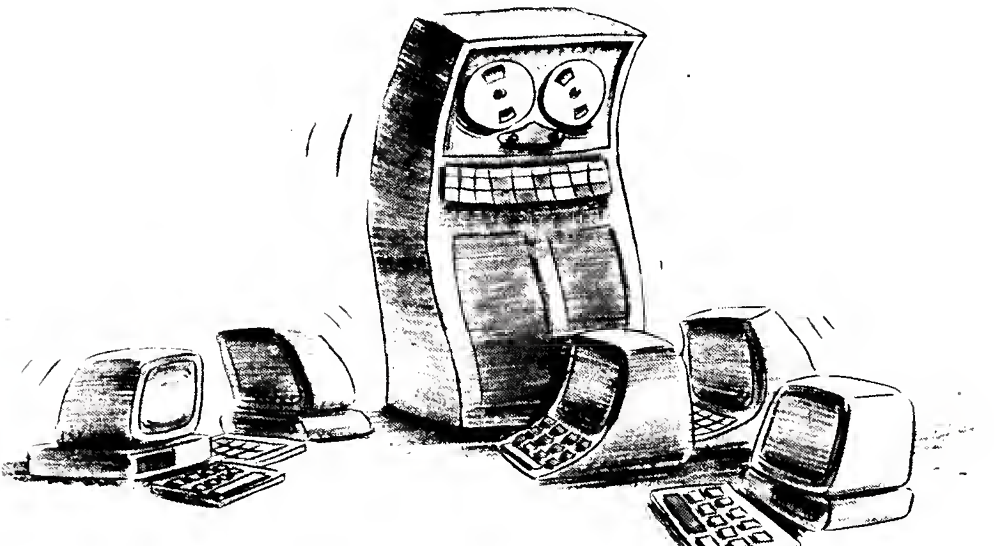
Using Dbase II, for instance, you can create a whole new report in just minutes, as opposed to hours using Cobol. The file transfer problem is no worse than for Cobol to Cobol, given the necessity to create sequential update files in either case. The above-mentioned products allow creation of files in "foreign" formats with little effort.

It is time to start training some of our Cobol programmers to use micros effectively, which means giving them some modern tools to work with and allowing them the time to learn how to use them. While moving Cobol code directly to micros may produce some short-term gains, training experienced Cobol programmers in the use of personal computer tools appears to be a much better long-term investment in talents and resources.

If DP professionals are going to retain control over corporate data processing policy, they must learn how to use micros effectively, as many of their users already do. It's time to stop using the broad base of Cobol programming skills out there as an excuse to justify keeping ancient and inefficient systems alive through yet another generation.

About the author

Dick Burkhalter is a business systems consultant for Diverse Developments, a Canoga Park, Calif., consulting and programming firm serving business users of micros.



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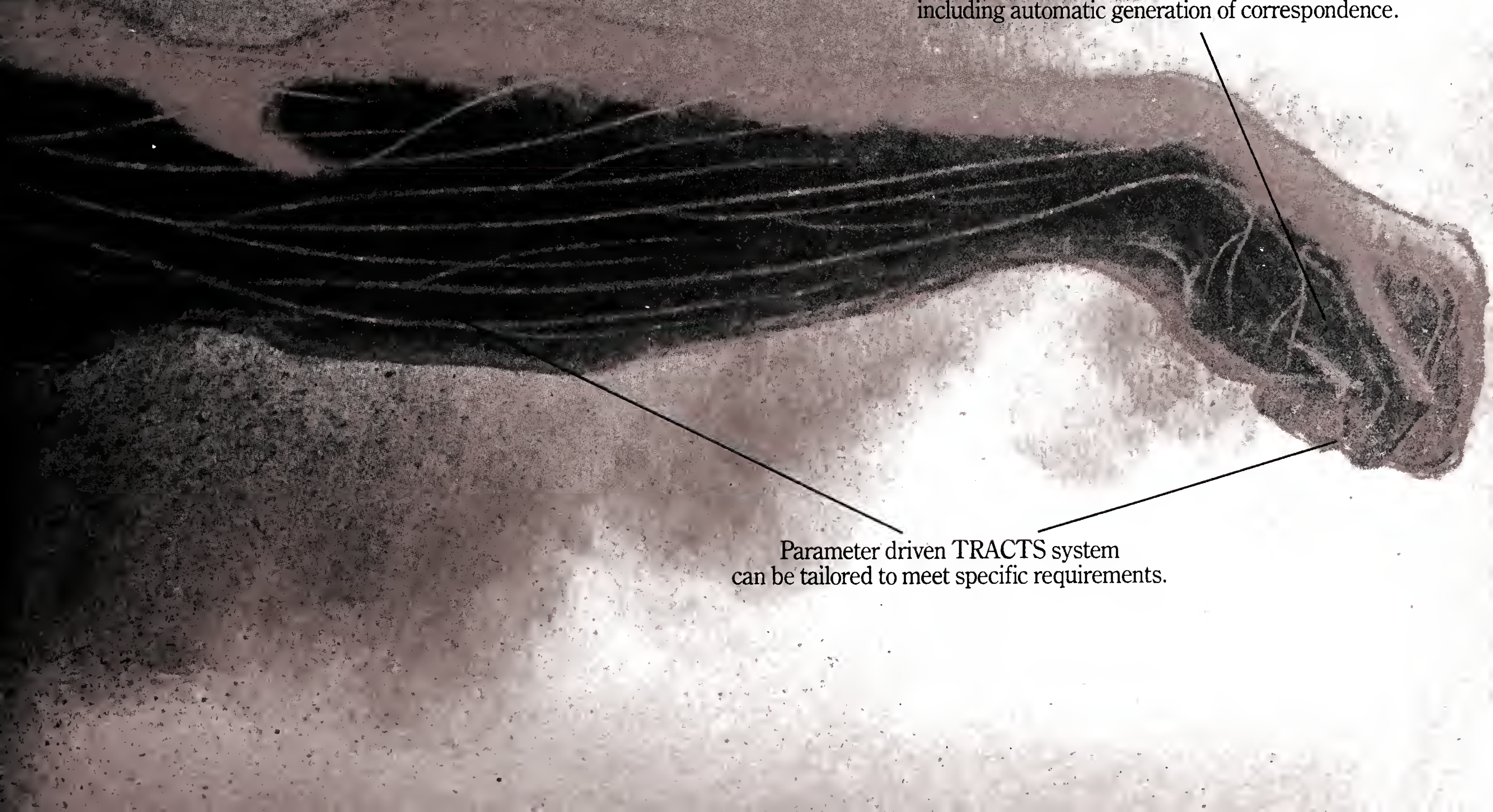

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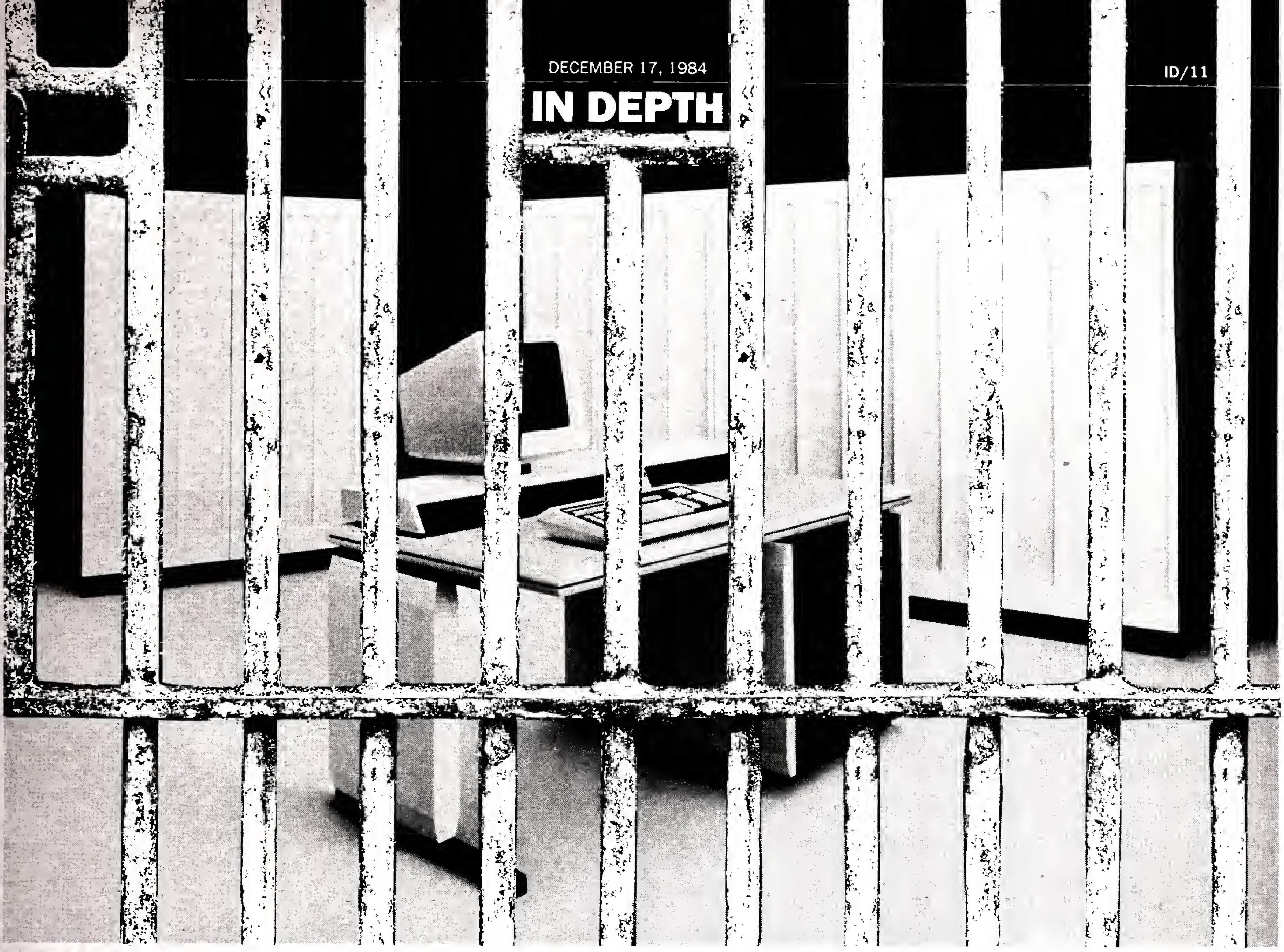

Don't rely on the law to stop computer crime

By Nancy Finn and Peter Finn

It is estimated that by the end of next year, more than 10 million personal computers will sit beneath the fingertips of American workers. These tools open up new opportunities for their owners, but they also open the door to infiltration into company business records and the deliberate distortion of information by unauthorized individuals. Losses resulting from computer-related crimes now range between $100 million and $300 million annually in the U.S.

There is no agreement among legal experts as to what constitutes a computer crime. Consequently, a generally accepted definition of a computer crime is notably absent from current legal opinion. Some experts dismiss the concept entirely, referring to "computer abuse" or "computer-assisted crime."

Computer abuse, broadly defined, is any incident associated with computer technology in which a victim suffered, or could have suffered, loss and a perpetrator, by intention, profited or could have profited.

Computer abuse can fall into one of five categories of currently recognized crime: financial crime, information crime, theft of property, theft of services and vandalism.

In view of the legal system, which often leaves the victim of computer abuse without recourse, it is essential users install preventive security measures as the first line of defense.

■ Financial crime is the taking of funds via computer, for example, executing the theft of a payroll through a computer system or just shifting monies from one account to another.

■ Information crime involves the acquisition of valuable information via computer, such as a company's mailing list, a list of solicitations or other contributions. It is one of the least detected and most costly of computer crimes.

■ Theft of property is simply the taking of computer hardware for personal sale or use. It is the easiest crime to categorize and prosecute.

- Theft of services is the unauthorized use of a computer, for example, use of a company's computer for personal, nonofficial use.
- Vandalism is intentional damage to a computer or computer system, either physical destruction or alteration.

Some computer abuse fits more easily into the traditional criminal statutory scheme, such as theft of physical computer property and vandalism. Other types of abuse, such as the taking of information or services, are more difficult to analyze in traditional terms.

Notwithstanding the difficulty involved, it is essential that there be a recognition of the type and magnitude of harm caused by the computer crime so that there is proper analysis of the computer abuse problem. What the courts and the legislatures have to recognize is that computer abuse can occur in unobtrusive ways such as through fraudulent access or bugging of software. Unauthorized users are often so familiar and comfortable with the computer system that detection is particularly difficult.

It appears on the surface that computer abuse might easily be prosecuted under the law of theft. However, traditional criminal statutes such as larceny have been inadequate and ineffective in prosecuting computer abuses. Inherent in the law of theft is the notion that property capable of being stolen must be tangible and that such property must physically change possession. Thus, it is extremely difficult to prove the law of theft in the instance of computer theft without the abuser having physically removed a tangible item.

Tangibility issue

The tangibility issue was addressed in the case *Ward v. Superior Court* (California, 1972). The court found that the defendant had not stolen an "article" within the meaning of the penal code because implicit in the definition of the article is that it must be something tangible. The court found that electronic impulses are not tangible.

A further complication arises in determining the valuation of an item that, in the case of a computer crime, might not be tangible. Is the valuation of the stolen property based upon the price of the paper on which the program was written, or is it the value of the bit of information to the company or the owner of the program? The valuation is necessary in order to distinguish between an offense punishable as a felony and an offense punishable as a misdemeanor. Assessing damages in this instance is a speculative issue, and statutes have not been developed to address the issue.

One case that illustrates the problem of inadequate criminal statutes is *U.S. v. Siedlitz.* An individual used a telephone to gain access to a former employer's computer and thereby obtained a valuable and confidential program. The U.S. attorney in Maryland and Virginia attempted to prosecute the theft but encountered difficulty in using the federal statute prohibiting interstate transportation of stolen property.

Not only was the statute unclear about whether the electronic impulses were property within the requirements of the statute, but furthermore, the movement of magnetic impulses from the victim's computer to the defendant's computer did not satisfy the traditional interpretation of "stealing" or "taking" of property as required by the statute. This ambiguity clearly demonstrates the complications that exist both in determining whether or not there was a theft under the law and whether or not the object of the theft can be classified as property.

Many federal and state criminal statutes, including embezzlement, invasion of privacy, trade secret, copyright and even mail fraud laws, have been used to prosecute computer crimes. It is often erroneous, however, to apply these criminal statutes to computer crimes, because the intent of the specific law often represents different issues from those in the computer crime instance.

For example, in cases of embezzlement, if no property or money is converted, the criminal charge cannot be maintained. In the event of a trade-secret theft charge, there is the issue of "unprotected disclosure," whereby, if the computer trade secret owner failed to take reason-

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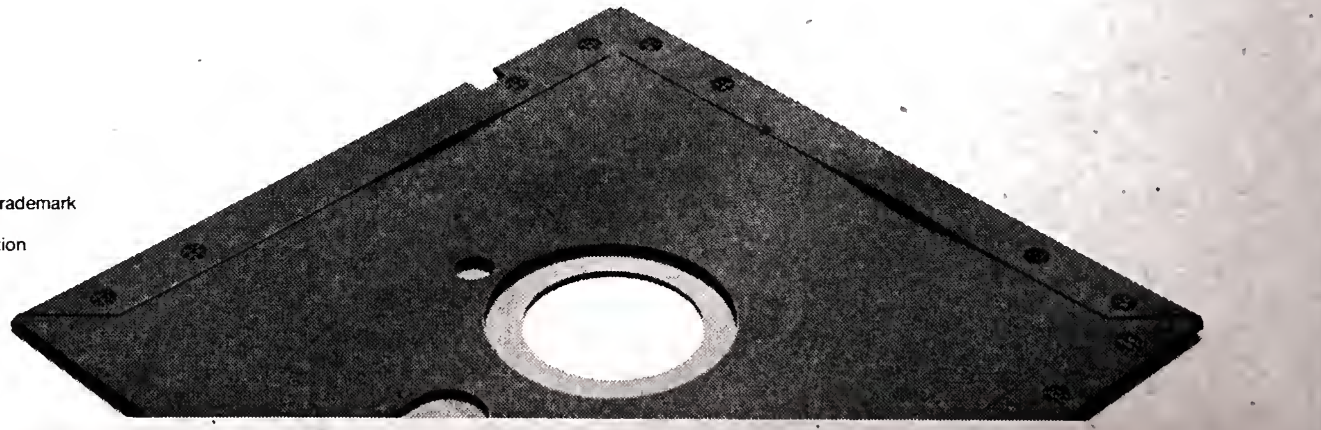

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The most innovative approach to the computer abuse problem is the Florida Computer Crimes Act of 1981. It created two new classifications of computer offenses: an offense against intellectual property and an offense against the authorized computer user.

able precautions to protect the secrecy of the thing allegedly stolen, the law does not apply.

The case of *New York v. Weg* (New York Superior Court, 1982) illustrates how difficult computer crime statutes can be to uphold. The judge dismissed the theft of services charge against a computer systems manager employed by the New York Board of Education who used school computers to trace the genealogy of horses and create a handicapping system for betting.

The court found that Theodore Weg had not stolen time because his supervisor had given him general access to the computer. If Weg had plugged into a public computer without permission and was trying to avoid payment, his acts may have been considered criminal.

Legislative efforts

The most innovative approach to the computer abuse problem is the Florida Computer Crimes Act of 1981. It creates two new classifications of computer offenses: an offense against intellectual property and an offense against the authorized computer user. The first classification provides that whoever willfully, knowingly and without authorization modifies or destroys data, programs or supporting documentation, internal or external to a computer, is guilty of a felony against intellectual property. The second offense holds an individual liable for a felony if he, without authorization, denies an authorized user access to computer system services.

This statute distinguishes between misdemeanor and felony crimes on the basis of whether the offense results in damage, destruction or fraud or results in the interruption of government operation of public services and whether the amount of damage to the computer or computer system falls within a specific range described in the statute.

Another unique aspect of the Florida statute is that it recognizes computer abuse as a separate criminal activity within a range of degrees and penalties. By penalizing many types of computer abuses such as unauthorized access, the statute shifts the focus away from the harm, the tangibility of the item or the possession characteristics inherent to conventional theft laws.

Twenty-one states have passed specific computer crime laws directed toward the special needs of prosecuting computer abuse and misuse.

Legislation on the federal level has been limited.

This past year, Congress enacted two pieces of computer crime legislation. The Small Business Computer Crime Prevention Act sets up a private and public task force to investigate the problem of computer crime in small business and recommend preventive measures.

Just before adjourning in October, Congress hastily passed computer crime amendments attached to the continuing budget resolution. The amendments make it a federal crime to gain unauthorized access to data stored in computers used by the federal government or to financial data protected by federal privacy statutes. The legislation (a compromise version of H.R. 5616) does not address illegal entry into other private-sector computers.

Most recent federal legislative efforts have been unsuccessful. The Federal Computer Systems Protection Act (H.R. 1092) spent five years in subcommittee and was bypassed this year by H.R. 5616.

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At issue is whether the existing body of law is fully adequate for both the crime and the punishment. At issue also are potential conflicts over jurisdiction between the states and the federal government.

There were concerns about the adequacy of H.R. 1092, which failed to define such key terms as "computer." Some observers feared that such imprecision might lead to misapplication or abuse of the legislation itself, for example, in prosecuting offenses committed by minors.

It was also argued that the proposed legislation focused upon the instrument rather than the object of the crime: the computer rather than the information, its tangible and intellectual properties and individual rights. While there is a certain truth to this argument, the body of law regarding information, its sensitivity and value as well as its intellectual property, is even less well defined.

A number of bills languished in Congress during 1984 and, specifically, in subcommittee. In 1984, four bills awaited action in the House Judiciary Subcommittee.

H.R. 4301, introduced by Rep. Larry Coughlin (R-Pa.), was unique in that it was only three paragraphs long. The bill would make the use of a computer in a manner not authorized by the owner a federal crime punishable by a fine of up to $100,000 and up to 10 years' imprisonment.

In February 1984, Sen. William Cohen (R-Maine) introduced in the Senate the Computer Crime Prevention Act of 1984. The bill, which died in October, contained provisions and penalties for buying, procuring or selling the passwords to the computers covered in the legislation in order to obtain money or services illegally. The penalties for this offense would be $50,000, or three times the amount obtained, and/or a maximum prison sentence of five years.

To deter computer hackers, penalties for any unauthorized access not involving fraud or damage would be up to $5,000 and one year in jail.

Civil law

While most attention is currently being given to the criminal aspects of computer abuses, it is likely that civil action will have an equally important effect on long-term security problems. The issue of computer crime draws attention to the civil or liability aspects in computing environments.

In the future, we can expect to see many more individual and/or class-action suits. For example, a stockholder might sue a corporation that had to devalue its assets and stock because of computer fraud-related losses. Another scenario might involve stockholders filing suit because the loss of highly sensitive trade secrets seriously affects the corporate balance sheet. Liability of the corporation and its officers to protect its assets and resources, such as imposed by the Foreign Corrupt Practices Act, will also be tested.

Civil damage suits will test the concepts and limits of legal responsibility and culpability. It will be interesting to see how the courts, state and federal government attempt to determine responsibility and assign liability for damages. Who will be at fault? The user, for not providing better security for the system? The equipment manufacturer, because of alleged flaws in the security design?

Even today, the liability battle lines are being drawn. Vendor advertisements in major national magazines proclaim that "privacy begins at home," and "computers don't steal, people do."

In the future, we can expect to see many more individual and class-action suits.

In equipment lease agreements, many vendors very clearly spell out that the lessee bears full responsibility for all aspects of system security. Clearly, as liability issues are tested in the courts, all parties — the end users, corporations providing computer-based services and the manufacturers of computers and related systems — will be forced to look more clearly at their own areas of responsibility and act accordingly.

Nonlegal remedies

In view of the legislative weaknesses, which often leave the victim of computer abuse without any legal recourse, it is essential that computer users look to preventive security measures rather than to legal measures as the first line of defense. Among the commonsense rules for safeguarding data are the following:

- Regularly change the password for access to the system.
- In addition to the password, require such personal information as an employee's name, birthday or identification number. It is far more difficult for someone to come up with two correct identifications.
- Limit the number of attempts that anyone can make to log on to a system.
- Keep a record of all user activity in a system and monitor this log to detect any unusual activity such as repeated failures by someone to enter a correct password, unusual amounts of data retrieval and attempts to enter confidential files.
- Follow through at a top management level by allocating the money and staff necessary to carry out these steps. Prosecute any security violations, whether employees or outsiders, even if it means adverse publicity.

There is software available that will improve security. These programs typically limit the number of

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tries a user gets to type in a correct password and will prevent intruders from repetitively guessing until they hit a valid password. This type of software ranges in price from $9,000 per year for an annual rental to about $30,000 if purchased.

A dial-back system is also available that screens out the thief trying to forge a password. When a user calls into a computer, a black box intercepts the call and asks for a password. The unit then disconnects the phone call, looks up the password in a directory and calls the user back at the phone number listed in the directory.

Corporate personal computers also need protection. With proper precautions, there is a far greater opportunity for legal action in the event of computer abuse than there would be if no precautions were taken. The same issues that arise if fire protection is ignored and there is a question of insurance coverage hold true for computer security; it is also questionable when proper computer security is not undertaken.

Poor controls

Even today, most organizations do not recognize that their information is sensitive or critical. They basically do not adequately analyze the potential impact of an unauthorized entry. Lacking this understanding, companies fail to apply currently available physical and logical security controls to their sensitive and critical data. Where controls are applied, they are often incompletely implemented, poorly monitored or improperly managed.

The issue is further broadened by the wild proliferation of personal computers in organizations and the increasing ease with which computers can be tapped into via telephone lines. If a corporate executive stopped to figure out how much business could be lost if computer files were damaged or how much it would cost in man-hours to replace or reconstruct files that had been tampered with, they would realize the importance of computer security.

The ability of technology to build high-integrity software and certify that it possesses the necessary security and control attributes is extremely limited. Furthermore, office automation applications are creating important new privacy policy issues for management that go unrecognized.

A large majority of organizations are so busy with the hardware and software aspects of office automation that they have not begun to take these policy problems seriously. It has become apparent that professional and executive applications in the office environment can lead to data handling that can violate organizational and legal standards of data privacy.

In the 1970s, federal or state statutes covered confidentiality regarding federal agency practices, credit reporting, employment and insurance investigations, law enforcement and medical records as these various endeavors were plugged into computer systems. The trend toward office automation calls for extending those privacy standards from data processing into the office.

However, office automation, unlike data processing, does not store large volumes of information in centralized, organizational systems. Information in the office environment is scattered among many individuals and on many personal computers and other computer systems where there is an inherent lack of sensitivity to the principles of information security. The danger is even greater than it has been in the data processing environment since information that is kept in office files is often more finished and refined than the raw statistics found in the corporate mainframe.

As electronic messaging systems begin to proliferate and data is accessible and available to a number of people, confidentiality breaches will inevitably happen.

This risk has created a whole new compendium of issues around privacy concerns that have not been addressed either through the law or in common practices within the business community.

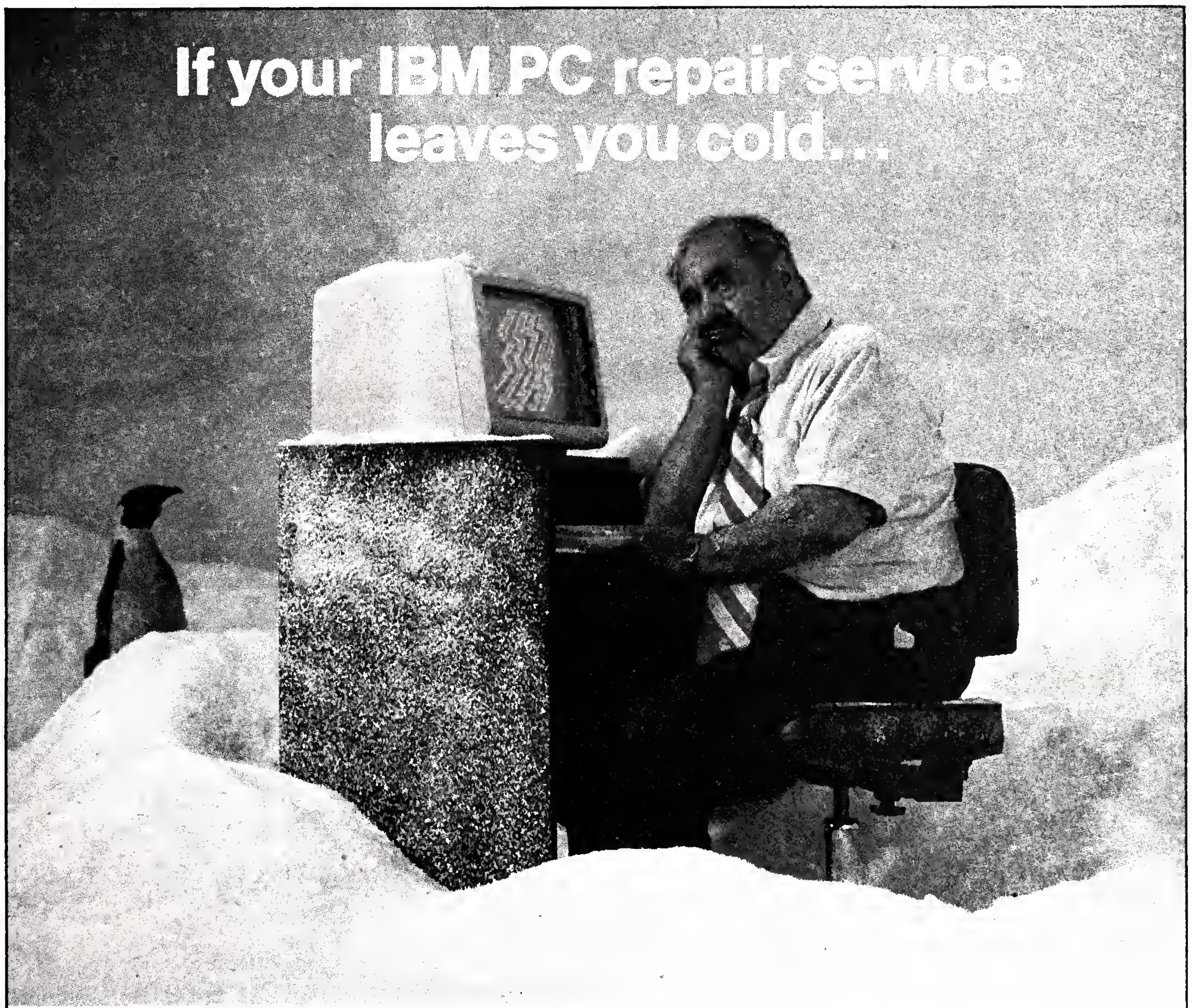
As the number of systems increases, crime problems will increase. The potential for this increase was set forth in the testimony of John C. Kenney, acting U.S. Assistant Attorney General for the Criminal Division before the Senate Subcommittee on Criminal Laws and Procedures. Kenney said:

"Our political, economic and social institutions have grown increasingly dependent upon computers to the point that their illicit manipulation or malicious destruction can potentially wreak havoc on society. Consider in this regard the consequences resulting from the willful destruction of the computer-generated Social Security checks flowing to the elderly or disabled, the destruction of a bank's computer records of its demand deposits or the malicious destruction of irreplaceable medical research data stored in a computer bank.

"Computers have become a part of everyone's life and are being integrated into virtually every facet of human activity at an ever-increasing rate. The very existence at the present time of a broad base of computer usage and computer knowledge and its projected increase in the years to come suggest that we will experience an increase in the opportunities for computer-related abuses in the years ahead."

About the authors

Nancy Finn is an office automation consultant for Communication Resources, Needham, Mass. Peter Finn is an attorney with the Boston law firm of Guterman, Horvitz, Rubin and Rudman.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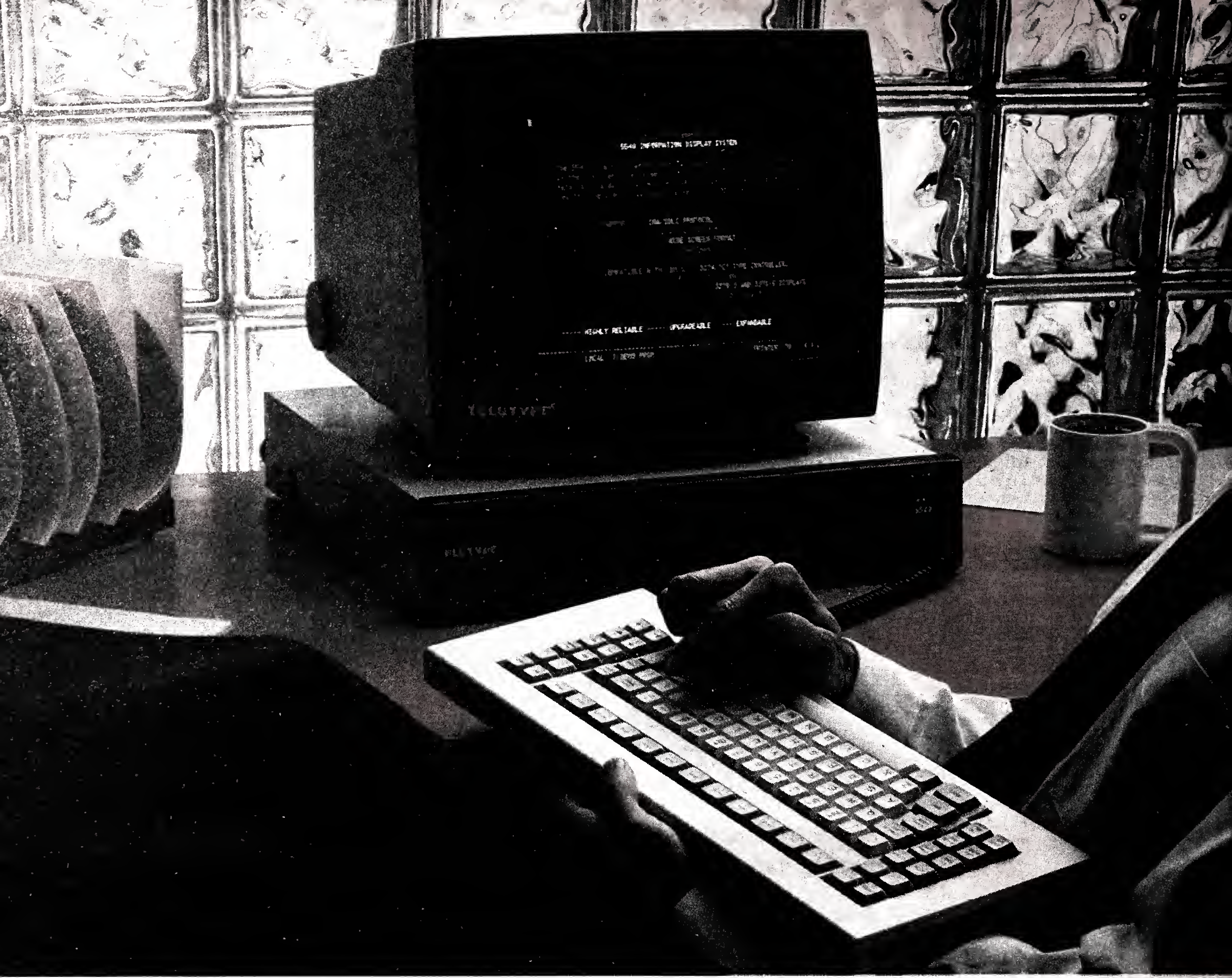

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SYSTEMS & PERIPHERALS

INSIDE
Auxiliary Equipment/59

Panel weighs supercomputer potential

By John Desmond
CW Staff

TARPON SPRINGS, Fla. — Experts at a Gartner Group, Inc. conference panel on supercomputing held here recently could not agree on a precise definition of a supercomputer or on the machine's commercial potential, but they did agree that demand for the fast-processing machines exists and that engineering applications are practical now.

The five-member panel at the IBM Large Computer Market Conference was led by David L.R. Stein, a general partner in the Julian, Cole and Stein venture capital firm and a cofounder of the Gartner Group. Other panel members were Carl Claunch, director of marketing technology planning with National Advanced Systems, Inc. (NAS); Arthur Leiz of Grumman Data Systems Corp.; Robert Wayne McIntyre, director of special-purpose systems for Amdahl Corp.; and Gregory P. Williams, a vice-president of the Gartner Group.

Explaining why a discussion of supercomputing was being conducted at a conference for users of IBM 370-compatible mainframes, Stein said the 370 architecture is not incompatible with supercomputing, a term he said was coined by Control Data Corp. in the early 1960s. That is a change from the thinking of 20 years ago, when IBM 360 architecture (the 370's predecessor) was considered incompatible with supercomputing.

Although many early innovations in computing were the results of efforts to develop supercomputers, "For whatever reason, supercomputers seemed to fall on hard times" in the past 10 years, Stein said. But he said recent achievements by Japanese manufacturers in supercomputing, on machines that have a "significant relationship" to 370 architecture, have helped spur a renewed interest in supercomputing. "I don't know whether it's a Japanese challenge or the fact that we've outgrown our mainframes for some applications, but I have seen a resurgence in interest in supercomputers in the last several years," Stein said.

Claunch of NAS defined supercomputing as processing that exceeds the capacity of the largest general-purpose mainframe. Supercomputing is accomplished by restricting processing to that which can be executed more quickly under a special set of instructions, sometimes called vector processing, he said. Certain work that can be accomplished within the limited instructions can make use of the supercomputer, he said. Ten years from now, NAS is projecting that 10% to 15% of all large mainframes will include vector processing capability.

Leiz of Grumman suggested Claunch's definition of supercomputing is not adequate because as mainframe processing rates go up, more processing can be accomplished with general-purpose mainframes. Claunch said the definition could be that a supercomputer executes 10 times faster than general-purpose mainframes.

"I don't know if I have a good definition for a supercomputer other than to say that they run real fast when they have floating-point arithmetic," Amdahl's McIntyre said. The potential speed of a supercom-

See **PANEL** page 59

IBM 3081 seen as path to Sierra

Analyst says CPUs will attract Model K users

TARPON SPRINGS, Fla. — At a recent conference on "Strategies in an Era of IBM Strength," Michael A. Chuba of the consulting firm Gartner Group, Inc., predicted that IBM's 3081 Model K will be the "exit machine" used to shuttle users into initial models of IBM's Sierra series of mainframes, which the Gartner Group claims will be announced in the spring of 1985.

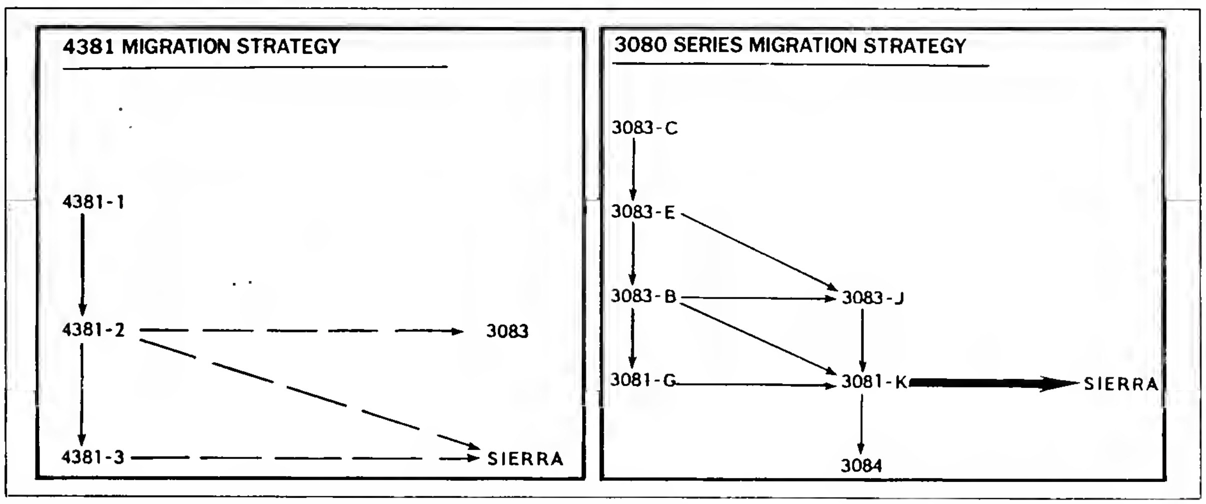
IBM is trying to have 50% of the installed base of 3080 Model X processors on the 3081 Model K when the Sierra is announced, Chuba said. The Sierra announcement will compare its performance to the 3081 Model K, and not all the Sierra's features will be announced in the initial product, predicted Chuba, who is program director for Gartner's IBM Large Computer Market service.

To make projections of likely features of the Sierra series and options for users of IBM's 3080 and 4300 series, Chuba employed the Gartner Group's Residual Asset Value for IBM Systems software model for describing the IBM market. Gartner Group justifies using only IBM in the model on the basis of the company's dominant position in the industry.

In describing IBM's dominance, Chuba said that 60% of IBM's revenues are derived from the 370 hardware and software still employed in most of its current line CPUs. Since IBM accounts for 40% of worldwide data processing revenues for U.S. manufacturers, the 370 accounts for 25% of worldwide DP revenue from U.S. manufacturers, Chuba said. The 370 hardware and software products comprise "the single largest segment of the data processing industry," Chuba said.

Moreover, Chuba said IBM has 25,000 mainframes and 100,000 disk drives installed in the U.S. today. IBM has been steadily increasing market share at the expense of the firms that make up the Bunch

See **CHUBA** page 58



GARTNER GROUP, INC. CHART

Expected migration to anticipated IBM Sierra series

Hitachi experimenting with Cmos chip

SAN JOSE, Calif. — Hitachi Ltd. said it has developed an experimental 32-bit Cmos microprocessor chip called the Micro 32.

According to Hitachi, the unit was fabricated on a 1.3 micron Cmos substrate using a two-layer metal process technology.

The chip is said to contain more than 300,000 transistors.

Internal throughput

Micro 32 reportedly offers internal throughput of roughly 5 millions of instructions per second.

Hitachi said the unit incorporates a 200K-bit read-only memory with a 50-nsec cycle time. The chip measures 6.5mm by 9mm, but no definite packaging configuration has been established.

Hitachi said the product will not be commercially available until late 1986.

According to the vendor, volume shipments are slated to begin in mid-1987.

For more information, Hitachi is headquartered at 2210 O'Toole Ave., San Jose, Calif. 95131.

Modcomp CPU controller supports 32 I/O options

FORT LAUDERDALE, Fla. — Modular Computer Systems, Inc. (Modcomp) has announced the APC/5 Advanced Programmable Controller for use on the company's Classic CPU in industrial automation markets for support of 32 process I/O options and up to 2,048 I/Os.

The product is said to support a range of data types in digital I/O and analog I/O and to simplify programming. The programming device is said to enable engineers to define the logic with standard Instrument Society of America (ISA) symbols.

The APC/5 combines the Modcomp Modacs V hardware with software designed by Thesaurus, Inc. The controller can be used for applications with 250 to 1,024 processing I/O points. The APC/5E provides for systems as large as 2,048 process I/O data points. The controller has the capability to display seven inputs and one output on each line of a ladder diagram on the color terminal, the vendor said.

Use of ISA standard graphics character symbols and colors allows quick recognition of elements and power-flow states. Up to 16 lines may be included in one network with a possibility of up to 999 networks, each operating in specified time segments of 50 msec, seconds or minutes. The user can create or edit one control algorithm while displaying another, the company said.

The APC/5 Programmable Controller is said to be capable of testing the validity of programs before they are run on actual equipment, the company said.

The price for a typical system configuration consisting of an APC/5 Programmable Controller unit with color graphics programming device and 256 process I/O points, is $50,000. An optional documentation device is available for another $7,000, the vendor said.

Modcomp can be reached at P.O. Box 6099, 1650 W. McNab Road, Fort Lauderdale, Fla. 33310.

CHUBA

from page 57

companies (Burroughs Corp., Univac [Sperry Corp.], NCR Corp. Control Data Corp. and Honeywell, Inc.), so that IBM controls some 76% of the market today, according to the Gartner Group figures.

Chuba said IBM's large-systems marketing strategy includes announcing top-of-the-line models before low-end models to minimize the impact on sales of existing series, cutting prices to stimulate sales of existing lines when new lines are announced and offering customers the option of field-upgradability to realize the benefits of improved price/performance. "The field upgrade strategy serves as a type of competitive lockout," because it is often easier for users to upgrade than buy a plug-compatible product, he said.

As to frequent user inquiries about whether IBM will cut off upgrades of other models to force users to Sierra, Chuba said, "We think that's highly unlikely." IBM will be more likely to stabilize the price of upgrades, so that in years to come upgrades will not be as attractive as buying the new machines, he said.

Better price/performance

The Gartner Group expects that the Sierra will not be field-upgradable, but IBM will offer superior price/performance to entice users to Sierra, Chuba suggested. He predicted that Sierra will offer approximately $200,000/one millions of instruction per second (Mips) price/performance in a minimum configuration.

The Gartner Group also predicted that succeeding the Sierra, perhaps in 1988, will be the Summit series, with price/performance closer to $100,000/one Mips, Chuba said.

IBM has shipped 4,000 to 5,000 3080 series processors in the last three years and should ship 7,000 to 8,000 Sierra CPUs during its product life, Chuba said. Demand will fuel the increase, and IBM will be able to produce more Sierras than 3080 Model X series CPUs without adding manufacturing capacity, because Sierra will have fewer components, Chuba said.

An integrated array processor is possible in the Sierra, perhaps as an option, to appeal to science and engineering markets, Chuba said. The Gartner Group also predicted that the Sierra will feature main memory of up to 256M bytes and higher channel speeds.

"The important thing to realize about these features is that they probably will not all be there at the outset," Chuba said. IBM will try to downplay the differences between Sierra and the 3080 Model X series initially, to preserve the market value of the Model X series. Gartner Group does not expect a low-end Sierra until 1986, Chuba said.

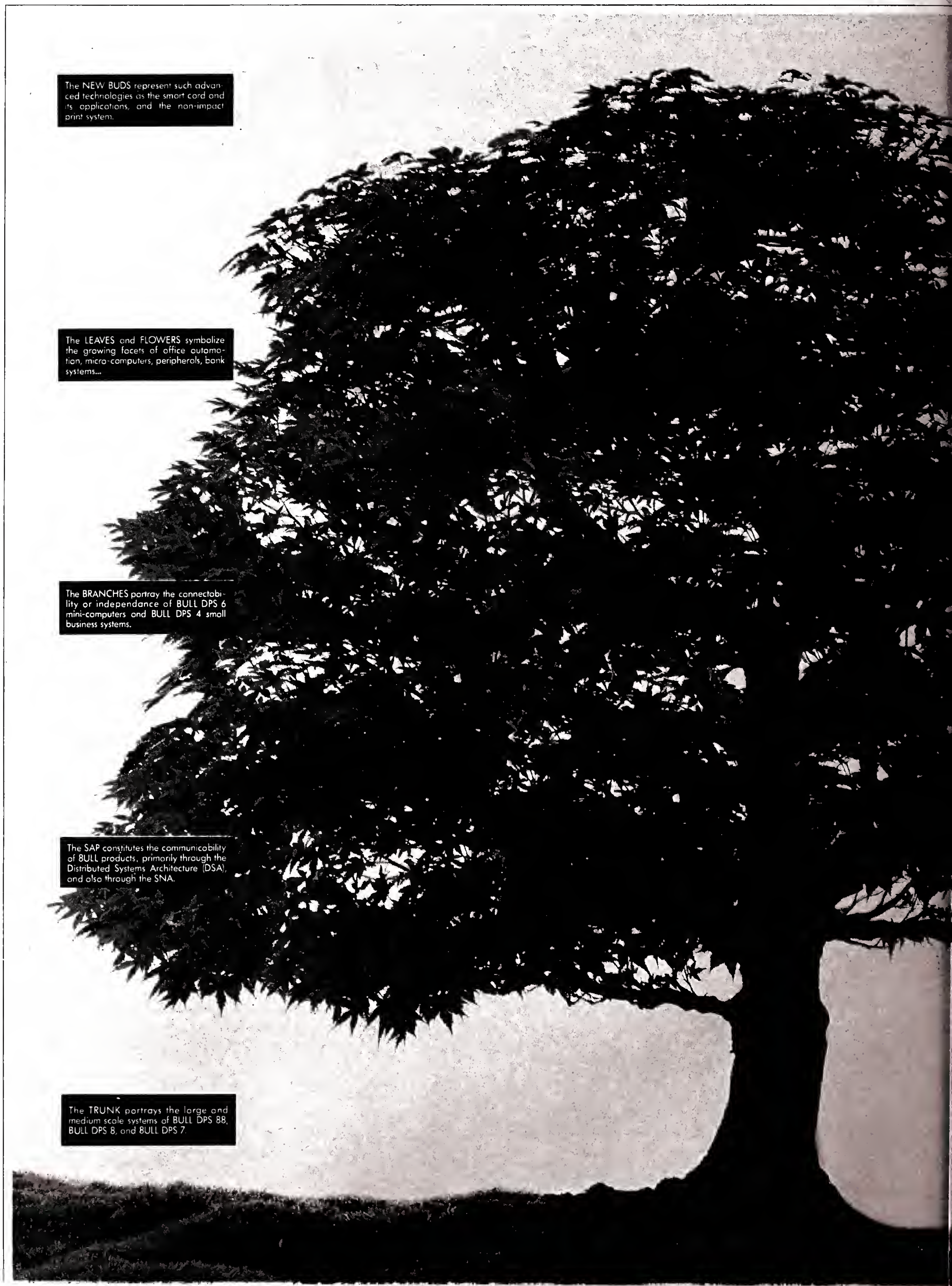
All these incentives will make Sierra attractive to users, "If not for what it offers now, then for what it offers potentially in the future," Chuba said.

Users of 4381s, in the absence of a low-end Sierra, will have the option of moving to the 3033s, Chuba suggested. Citing confusion in the marketplace about how the air-cooled 4381s and liquid-cooled 3033s compare, Chuba pointed to the advantages of the 4381's lower price per Mips and the fact it requires less space in a data center. "From a price/performance standpoint — from many standpoints — the 4381 today is a much better buy than the 3083," he said.

When 4381 users "run out of gas," the Gartner Group predicted that IBM will, in 1986, announce performance improvements for the line or announce new models. But, "We don't see the 4381 family getting bigger in any significant way," such as with a quad-processor, Chuba said. Perhaps in 1987 or 1988, IBM will announce a follow-up air-cooled CPU to the 4381 family, he suggested.

For the approximately 8,000 4341 users in the U.S. market, the 4381 or 3083 is the upgrade path, Chuba said, adding that the Gartner Group expects that 90% of 4341 users will go to the 4381.

The decision for those users should be based on growth factors, he advised. Firms with over a 50% compound annual growth rate should migrate to the 3083, and firms with less than a 50% rate should consider the 4381, the Gartner Group advises. IBM may sell 8,000 to 10,000 4381s in the product's life, to make it one of their most successful CPUs, he suggested.



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PANEL

from page 57

puter is 50 times faster than a general-purpose mainframe, he said.

Original intent

Stein suggested the original intent of the supercomputer designation was to distinguish the processors as a class of CPUs at the high end of the spectrum, positioned above mainframes. Supercomputing implies "maximum computing at minimum cost," he suggested, acknowledging that any definition is likely to change in coming years.

Commenting on applications for supercomputers, Leiz said his company uses a Cray Research, Inc. supercomputer for structural and flow analysis, such as for air flow over an aircraft wing. Using a supercomputer, a wing structure can be modeled at one-fifth the cost of building a wing, he said.

McIntyre said that in engineering analysis applications, more accurate models can be run with supercomputers. Models that run on 370 architecture may be too simplistic for certain uses, he said.

Stein summarized that applications for supercomputers today are those too large for existing mainframes.

Lower costs, better designs

Claunch said research and engineering costs can be lowered and designs can be improved as a result of supercomputer use. He said one aircraft manufacturer achieved a 20% lower aircraft operating cost as a result of using a supercomputer to help model performance.

Automakers may be able to achieve similar operating improvements, he suggested.

Supercomputers could be used for high-speed transaction processing and possibly for artificial intelligence applications, Stein suggested. The Japanese may be motivated to develop supercomputers by a desire to develop AI applications that U.S. companies are not pursuing, he theorized.

Software wars'

"They [Japan] may perceive that as their secret weapon in the software wars," he said. "If the Japanese were successful in doing that, they could well be in a dominant position in the computing industry in as little as 20 years' time."

On the software issue, McIntyre said, "The machine is only as good as the software you have to exploit it." Scientific applications involving multiple CPUs linked in a parallel series are "fun to fantasize about" but not very useful in the practical world, he suggested. Getting jobs to run is what concerns users, he said.

With the exception of NAS and Amdahl hardware, most applications of supercomputers and array processors up to now have been for non-370 architecture for noncommercial purposes, according to Stein.

AUXILIARY EQUIPMENT

DATAGRAPHIX, INC.
COM for Sperry Corp. 1100/60-90

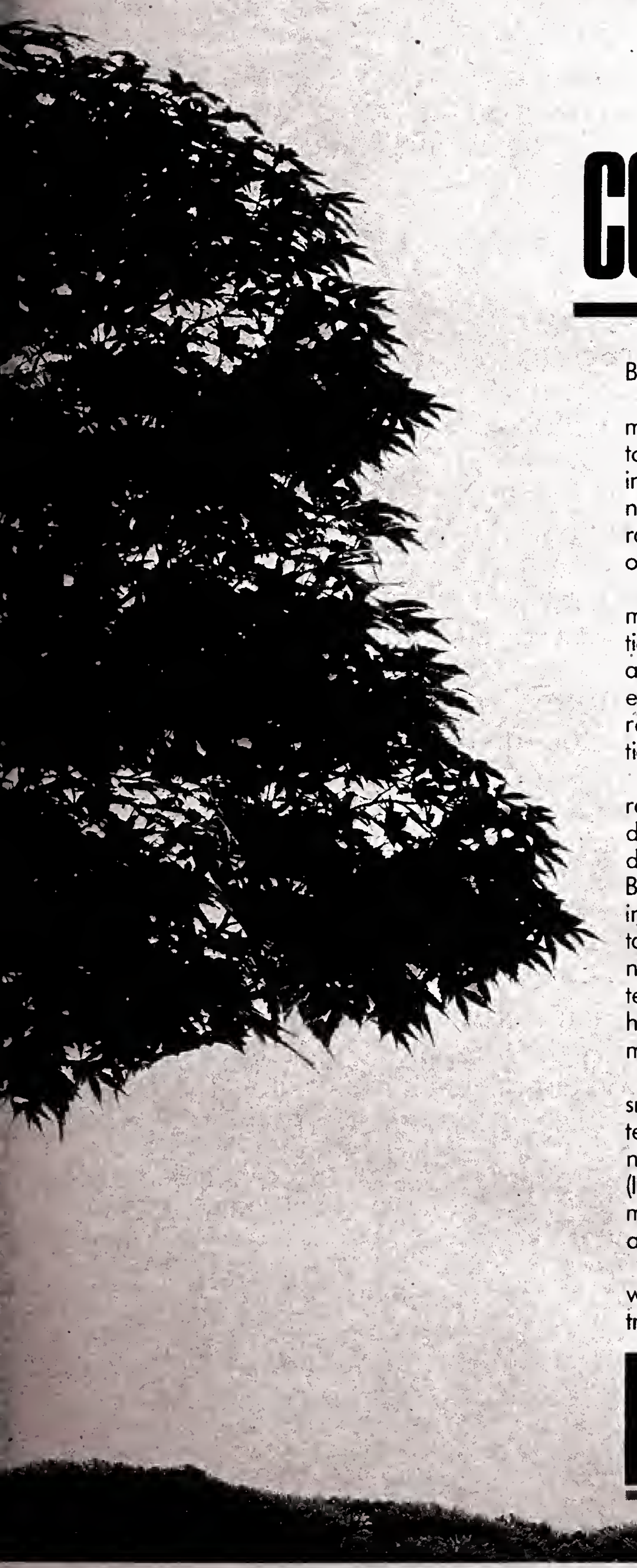
Datagraphix, Inc. has announced an on-line computer output microfilm (COM) capability for Sperry Corp. 1100/60-90 mainframes.

Users can choose from either of two cut-fiche on-line systems: the Autocom II recorder with self-contained chemical processing or the Aris II dry recorder, the company said.

Datagraphix on-line COM systems attach directly to all current Sperry Series 1100/60, 70, 80 or 90 CPUs.

The price for an on-line Model 2275 Autocom II is $112,800, according to the vendor.

Datagraphix, P.O. Box 82449, San Diego, Calif. 92138.



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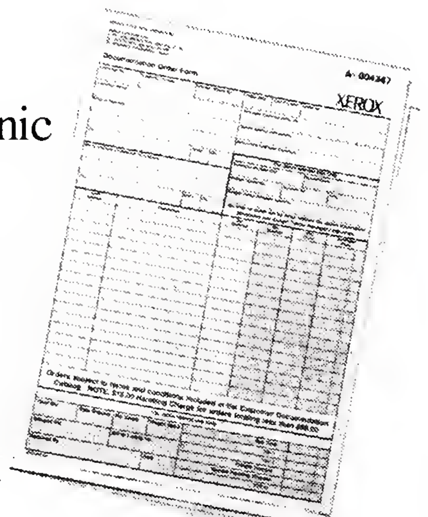

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In short, the Xerox Electronic Publishing System.

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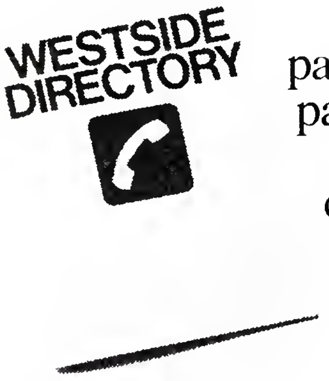
And what makes it so technologically advanced? A Xerox innovation called the Xerox Integrated Composition System (XICS). XICS is the software of electronic publishing. It lets you create print-shop quality, cover-to-cover documents from computerized text and scanned or computer-generated graphics.



Create and update company phone book.

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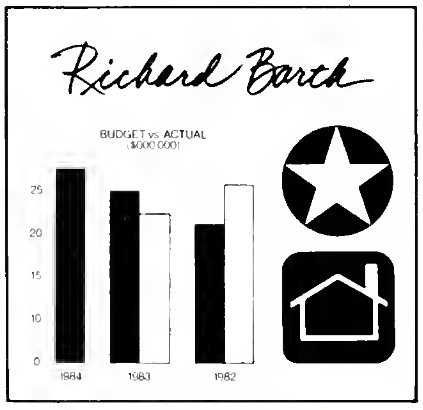

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Team Xerox

If you want more information than this illustrated example provides, simply ask for our free 16-page Graphics Capabilities brochure. It will give you complete details on how the Xerox Electronic Publishing Systems work.

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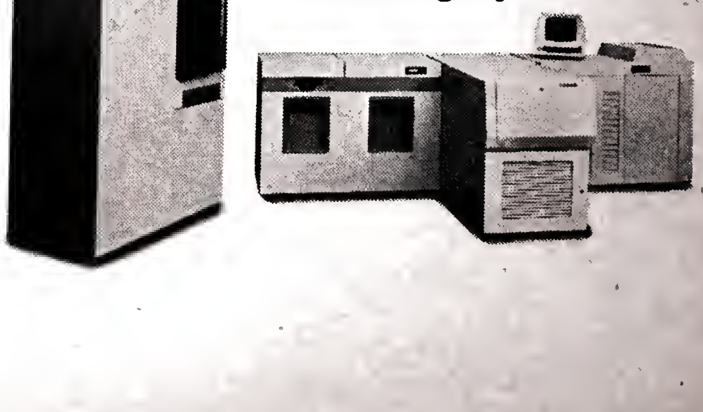
The Xerox Electronic Publishing System.



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MICROCOMPUTERS

IBM launches micro version of RS/1 package

File transfer, graphics packages for 3270 Personal Computers also debut

WHITE PLAINS, N.Y. — IBM introduced a Personal Computer version of Bolt, Beranek and Newman, Inc.'s RS/1 analytical package along with 3270 Personal Computer application software earlier this month.

RS/1 provides technical professionals with a variety of analytical tools, IBM said. Functions are said to include data entry and retrieval, data transformation and analysis, graphics, curve fitting, statistical analysis and analytical models. RS/1 also provides the Research Programming Language, which permits users to extend and tailor the system's capabilities and to interface with other programs.

RS/1 runs under PC-DOS 2.0 or higher versions on an IBM Personal Computer with 512K bytes of random-access memory and a dual-sided disk drive and a 10M-byte hard disk drive. The software also runs on similar configurations of the Personal Computer XT, Personal Computer AT, Personal Computer XT/370 and 3270 Personal Computer.

The $2,000 package is scheduled for sale by Jan. 25.

IBM also launched the IBM 3270-PC File Transfer Express program, which runs on the 3270 Personal Computer and is said to permit transfer of any type of file between that machine and a host system. The host system may be supported by standard Distributed Processing Control Executive/Distributed Office Support Facility or Distributed Processing Programming Executive/SP2 in an IBM 8100 or by appropriately coded customer-supplied System/370 software. Available this month, the program will cost $75.

In addition, IBM noted that it has shipped the 3270 Personal Computer/G and 3270 Personal Computer/GX and introduced the 3270-PC Color Graphics Applications program for those two machines.

The program consists of Graphics Editor and Picture Plotting components. The Graphics Editor reportedly enables users to create, modify, file and retrieve pictures and to display, edit and file pictures generated in the Picture Interface Format (PIF). The Picture Plotting software is said to give users the ability to plot Graphics Editor output or other PIF files. The software is scheduled for April shipment and is priced at $395.

Finally, IBM said its 7371, 7372, 7374 and 7375 color plotters now support the Models AT and XT, Portable Personal Computer and Personal Computers equipped with the General Purpose Interface Bus, except for the PCjr.

IBM National Accounts Division is located at 1133 Westchester Ave., White Plains, N.Y. 10604.

INSIDE

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SMALL TALK
Eric Bender
CW Senior Editor

IBM AT shipped before its time, many users say

Offhand, there's little resemblance between the Osborne Computer Corp. Osborne I and the IBM Personal Computer AT.

Introduced in 1981, the Osborne I was based on the then-ubiquitous Zilog, Inc. Z80 microprocessor and featured an oscilloscope-like 5-in. screen and ultralow-density floppy disk drives in a transportable package. The AT, built around Intel Corp.'s hotshot 80286 chip, comes with high-density floppy and hard disk drives and stoutly resists the trend toward taking a smaller footprint on a desk.

But there are curious parallels in the early customer histories of the two machines.

Both generated tremendous excitement when announced, both immediately began to carve out new territory for personal computers, and both also soon showed that they had shipped before they were ready.

"Any seasoned manufacturing executive would have deemed the Osborne I, when first shipped, to be in its preproduction stage," Osborne founder Adam Osborne later acknowledged in *Hypergrowth*, his book detailing the company's rise and fall. While other factors crippled the company, manufacturing difficulties plagued Osborne right up to the moment the firm filed for Chapter 11 protection under the Federal Bankruptcy Act.

IBM now has tens of thousands of Personal Computer ATs out in the field, and many reports have a curious ring of familiarity. Once again, the machines sound like beta versions. This time, how-

See **AT** page 69

Lattice unveils debugging tool

GLEN ELLYN, Ill. — Lattice, Inc. recently introduced C-Sprite, a debugging tool for software programs written in Lattice C or assembly language.

C-Sprite, which runs under IBM's PC-DOS or Microsoft Corp.'s MS-DOS Version 2 or 3, reportedly features Help screens, macros, command files, conditional commands and debugging through a communications port.

The software operates on COM or EXE files made up of object modules produced by the Lattice C compiler or Microsoft assembler, Lattice said. C-Sprite is said to provide a high-level view of C programs via function names, line numbers, variable names and C data types. It also reportedly gives a low-level view of machine addresses and instructions for testing assembly language functions or for microscopic examination of compiler-generated code.

Program behavior is monitored by planting break points, examining registers and variables and single-stepping if necessary, according to the vendor. Variables, registers and program instructions can be changed at any time, Lattice said.

C-Sprite will be available next month for $1,175. Lattice can be reached through P.O. Box 3072, Glen Ellyn, Ill. 60138.

In-house tech writers guide novice users

By S.L. Dean
Special to CW‡

Most personal computer hardware and software manufacturers make a real effort to provide sufficient information to use their products. However, many of them don't seem to realize that the secretary, accountant, vice-president or maintenance chief expected to use this new tool has never run a computer, is unfamiliar with the equipment and, quite possibly, did not wish for a computer at all.

To begin with, the new users are presented with the computer, peripherals, chosen software and a number of manuals.

The manuals theoretically contain sufficient information to allow the new user to learn whatever is needed. In some cases, this may be true. However, in the case of the truly novice computer user, even the words "peripherals" and "software" probably are unintelligible. Such a person is completely lost trying to cope with the intricacies of computers.

Some companies are perfectly willing to provide opportunities for staff to learn programs. Particularly in the case of the more complex programs, such as Lotus Development Corp.'s 1-2-3 and Micropro International Corp.'s Wordstar, the company may be willing to send

See **WRITERS** page 72

Conetic Systems adds desktop package

SAN LEANDRO, Calif. — Higgins, an "administrative assistant" software package for managers and knowledge workers, was introduced here this month by Conetic Systems, Inc. Designed for the IBM Personal Computer XT and compatible machines, the program is available in single-user and local-area network versions.

Unlike other microcomputer desktop organizing packages, Higgins offers expense reporting, multiuser local-area network support, phone message and electronic memo functions and the ability to track each item's relationship to everything else in the system, Conetic Systems said.

The package reportedly offers nine fully integrated modules built around a common data base: time manager, telephone directory (with autodialing and related capabilities), things-to-do list, personal filing, calculator, expense report, scratch pad, clock and tickler reminder. Higgins also is said to feature global information retrieval, note writer, keyword links to external programs, macros, customized reports and context-sensitive on-line Help.

The multiuser version of Higgins currently supports up to seven users on personal computer networks supplied by 3Com Corp. of Mountain View, Calif., and No-

See **HIGGINS** page 69

At $795, our DEC™-comp
a sophisticated image

© 1984 Wyse Technology

atible terminal projects even when it's off.

The WY-75 is the one VT-100 software-compatible terminal that looks intelligent even when it's not on.

And at $795, it looks as smart to the people who pay for it as it does to the people who look at it all day.

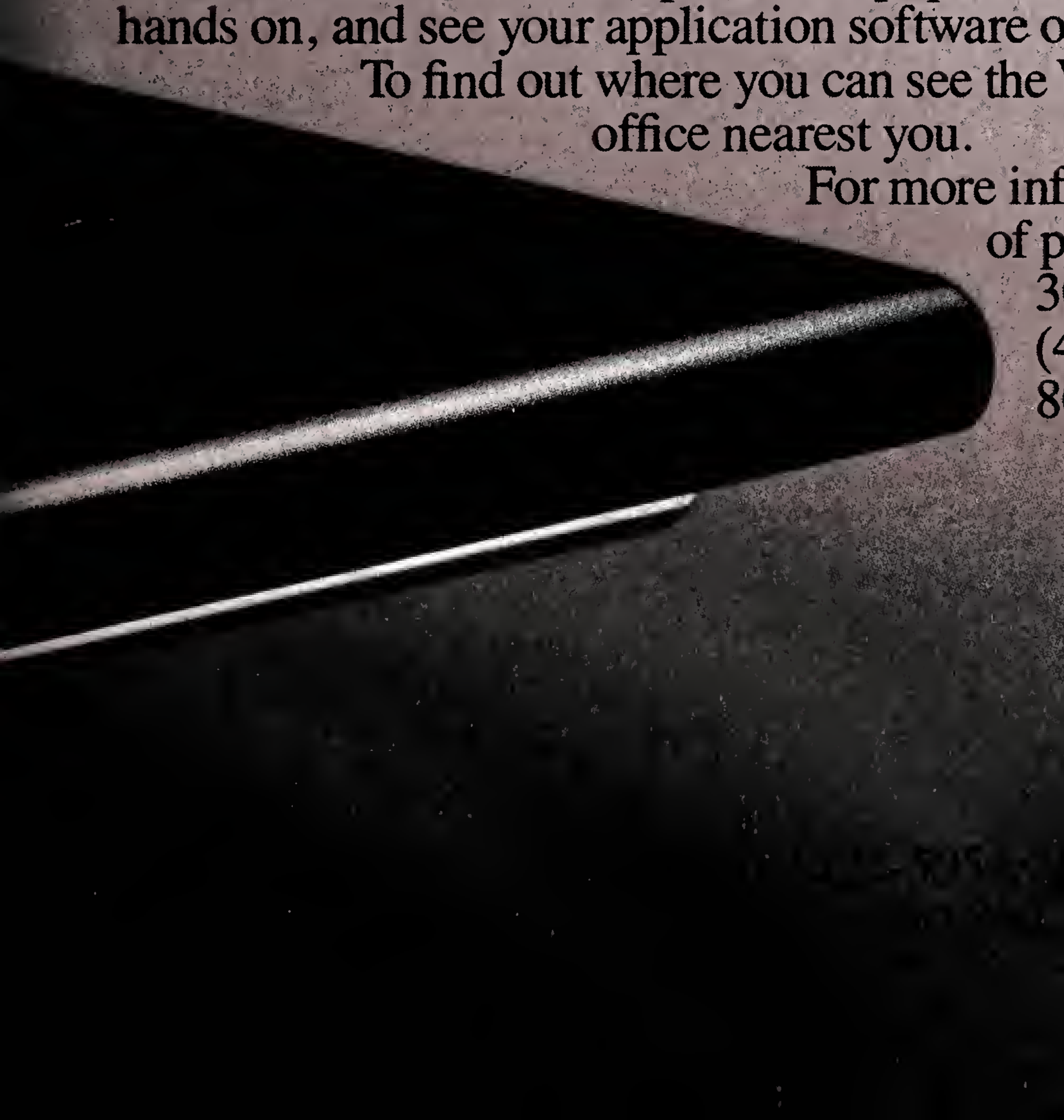
Like all our terminals, the WY-75 combines an unusually small footprint with a very generous 14″ diagonal display. The non-glare screen tilts, swivels, and displays a full 132-column format. The sculpted, low-profile keyboard adjusts, too.

We've done everything to make the WY-75 the best looking, best feeling, best performing terminal anywhere. On or off.

Can such a beautiful piece of equipment be the workhorse we say it is? Try it, hands on, and see your application software on the screen.

To find out where you can see the WY-75 demonstrated, call the regional office nearest you.

For more information about our complete line of products, write or call Wyse Technology, 3040 N. First Street, San Jose, CA 95134, (408) 946-3075. Outside of California 800-421-1058.



WYSE

[illegible] (305) 862-2221;
[illegible] Northwest (408) 559-5911.

SOFTWARE

SOFTWARE STUDIOS, INC.
PC-Desk

Software Studios, Inc. has announced PC-Desk, a desk management system that runs on an IBM Personal Computer with IBM's PC-DOS operating system.

The program is said to include an integrated address and telephone file, a calendar, a calculator and an automatic telephone dialer. PC-Desk will merge letters with addresses and print labels, stickers, an alphabetized phone directory and a log of system use, the vendor said.

The text of a letter reportedly may contain four variable fields including a person's name, company name, expiration date and a free-form field that the user designs.

PC-Desk costs $49.95 plus $2 for shipping.

Software Studios, 8516 Sugarbush Court, Annadale, Va. 22003.

QUALITAS, INC.
Tall Screen

Qualitas, Inc. has announced Tall Screen, a utility for IBM's PC-DOS operating system that stores up to 1,000 lines of PC-DOS output for review and editing.

With Tall Screen, a user can recall any previous command or string of commands with a single keystroke, the vendor said. The utility reportedly allows a block of text to be written to a file, printed or frozen on a screen. A user reportedly can edit any text on a screen and use custom keystroke sequences.

Tall Screen requires IBM PC-DOS 2.0 or higher, and an 80-col. screen is recommended. It is priced at $49.95.

Qualitas, P.O. Box 3AK/UPB, Las Cruces, N.M. 88003.

RATIONAL SYSTEMS, INC.
Instant-C

Rational Systems, Inc. has announced Instant-C, a C language interpreter available for microcomputers running IBM's PC-DOS, Microsoft Corp.'s MS-DOS and Digital Research, Inc.'s CP/M 86 operating systems.

Instant-C is said to implement standard C features so programs developed with Instant-C can be moved to other systems. A built-in screen editor displays source code errors and provides diagnostic messages, the vendor said.

The product reportedly includes break points, single-stepping by line of source code or function call and evaluating expressions.

Instant-C costs $500.

Rational Systems, P.O. Box 480, Natick, Mass. 01760.

'Your flexible screen mount doesn't seem to be working.'

MICRO SOLUTIONS, INC.
Uniform-PC

Micro Solutions, Inc. has introduced Uniform-PC, a utility that transforms diskettes created under Digital Research, Inc.'s CP/M operating system so they can be used with IBM's PC-DOS operating system.

The product transforms one IBM drive into a CP/M drive capable of reading, writing, formatting and copying diskettes, the vendor said. Standard Ascii files and other files reportedly can be moved between operating systems without altering the integrity of the file.

Menu-driven commands reportedly help the first-time user work with Uniform-PC. When the user is familiar with the product, all commands can be entered with a single-line entry from a PC-DOS prompt, Micro Solutions said.

Uniform-PC costs $69.95.

Micro Solutions, 125 S. Fourth St., DeKalb, Ill. 60115.

LAYERED, INC.
Front Desk

Layered, Inc. has introduced Front Desk, a time and resource manager that runs on Apple Computer, Inc.'s Macintosh microcomputer.

The product reportedly integrates scheduling for personnel and resources and analyzes project productivity and revenues, the vendor said. Front Desk is said to provide scheduling for up to 15 people or other resources.

The software provides reports on assignments for any or all people for a single day, week or day of the week or month. Front Desk keeps a history of the previous three months and schedules appointments for up to 10 months in advance, Layered said.

Front Desk costs $149.95.

Layered, 85 Merrimac St., Boston, Mass. 02114.

STOK SOFTWARE, INC.
Backrest enhancements

Stok Software, Inc. has enhanced Backrest, a utility for backing up hard disks on microcomputers running Microsoft Corp.'s MS-DOS, IBM's PC-DOS, Digital Reseach, Inc.'s CP/M and Musys Corp.'s Turbodos operating systems.

The enhancements include the ability to interrupt a backup at any time to perform another task or to format a floppy disk, the vendor said. Other additions include the ability to lock out bad sectors on hard

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"This company's marketing decisions are too big for one little spreadsheet. I need total decision support if I'm going to meet my revenue goals. And I need it now. Or after lunch, at the latest."

disk, optional restoration to an alternate drive and support of file-oriented tape backup devices, according to the vendor.

The program includes a menu-driven installation program.

Backrest costs $180.

Stok Software, 17 W. 17th St., New York, N.Y. 10011

WORDTECH SYSTEMS, INC.
Db/Index, Db/Debugger

Wordtech Systems, Inc. has introduced two utilities for users of Ashton-Tate's Dbase II data base management software.

Db/Index is a library of routines said to provide faster indexing, sorting and packing of Dbase II data files. It also includes a program that can repair some damaged data bases, the vendor said.

The Db/Index routines can be operated as stand-alone modules, or they can be called from Dbase II programs. The utilities reportedly can be used on microcomputers utilizing Microsoft, Inc.'s MS-DOS, IBM's PC-DOS or Digital Research, Inc.'s CP/M 80 and CP/M 86 operating systems. It is priced at $120.

Db/Debugger is a symbolic debugger for programs written in the Dbase II programming language. It is said to eliminate the need for Dbase II in program development and testing and to complement the vendor's Db/Compiler product.

Db/Debugger is said to enable programmers to set execution break points by file and line, automatically enter debugging mode after a run-time error, list and modify memory variables and data base items, list Dbase source code from any file and any number of lines and invoke an on-line help menu.

The utility, which runs on the same machines as Db/Index, is priced at $240.

Wordtech Systems, P.O. Box 1747, Orinda, Calif. 94563.

LANTECH SYSTEMS, INC.
Integrated/Office Series

Lantech Systems, Inc. has announced the Integrated/Office (I/O) Series, a collection of microcomputer applications for use under Unetix 2.0, the latest version of Lantech's AT&T Unix-compatible operating system.

According to a spokesman, the I/O Series provides a multitasking, windowed environment for Lantech's office automation application packages. The packages include Powerlink 100, an asynchronous communications program; IF, an integration facility; and PC-DOS Emulator, which allows the system to support most IBM PC-DOS applications.

The product reportedly combines a window-to-window transfer mechanism that can learn a long series of keystrokes or commands to automate repetitive tasks, such as entering spreadsheet data. The Powerlink 100 package is said to link IBM Personal Computers or compatibles to any host computer that can support a standard Digital Equipment Corp. VT100 terminal. With IF, Powerlink allows a user to transfer data from an application running on a minicomputer or mainframe directly into a local application.

The Unetix operating system with windowing costs $249. Powerlink 100 and PC-DOS Emulator are priced at $50 each, and IF is priced at $100.

Lantech Systems, 9635 Wendell Road, Dallas, Texas 75243.

POC-IT MANAGEMENT SERVICES, INC.
Microman

POC-IT Management Services, Inc. has introduced a microcomputer-based project management system for information services departments and software development groups.

Microman is designed to run on an IBM Personal Computer or compatible under IBM's PC-DOS or Microsoft, Inc.'s MS-DOS Version 2.0 or later operating systems. Features include work load control, project planning, management reporting and monthly financial report functions.

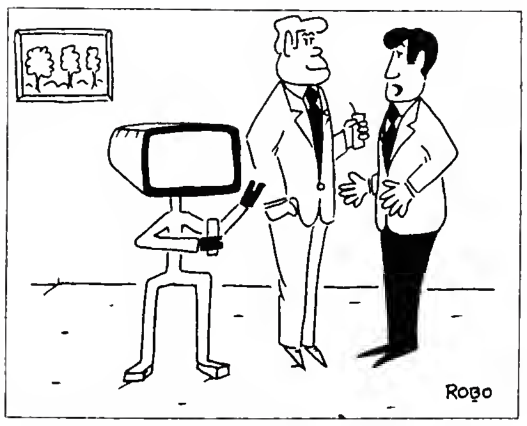
The price of Microman is $5,000.

POC-IT Management Services, Suite 606, 606 Wilshire Blvd., Santa Monica, Calif. 90401.

PARLAY SOFTWARE CORP.
Quota:100

Parlay Software Corp. has announced an integrated sales organization management system for IBM Personal Computers and compatibles running under Microsoft, Inc.'s MS-DOS operating system.

Continued on page 68



'Pretty clever bringing in a host computer.'

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"I want everything they want. And I want it all from an established company that's going to be around tomorrow."

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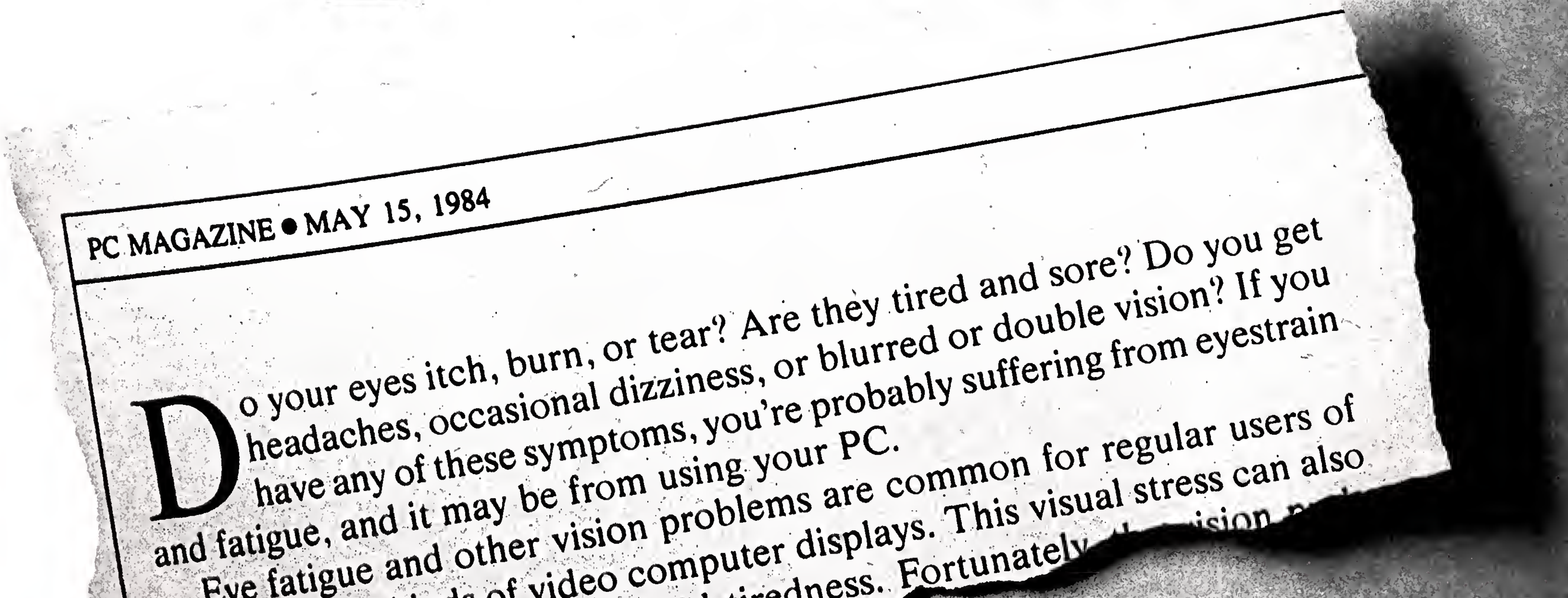
Sooner or later, you'll have to face this computer problem.



PC MAGAZINE ● MAY 15, 1984

Do your eyes itch, burn, or tear? Are they tired and sore? Do you get headaches, occasional dizziness, or blurred or double vision? If you have any of these symptoms, you're probably suffering from eyestrain and fatigue, and it may be from using your PC.

Eye fatigue and other vision problems are common for regular users of PCs and other kinds of video computer displays. This visual stress can also contribute to general tension and tiredness. Fortunately
lems experienced by video display users ha

Better sooner.

Better Sooner.

Computers don't ever get headaches.

But the people who use computers do.

Quite clearly, as PC Magazine spells out, that's not the only trouble they're having.

In case you're tempted to dismiss this as trivial, there are two things you should be aware of:

First, more than twenty states are already preparing legislation to force some improvements.

Second, if computer users suffer, so does business.

Because computers are only as fast and accurate as the people who operate them.

You are not a machine.

Computers are designed by engineers.

They usually know a lot about technology but very little about people.

Which is why so many computers are technically impressive but strangely unnatural to use.

Computer-induced problems (%)	
Eye strain	55%
Back pain	43%
Headaches	30%
Shoulder	25%
Hand/wrist	18%
Neck pain	15%

(Source: "Ergonomic Principles in Office Automation" Pub. 1983 by E.I.S. AB, Sweden.)

Ericsson, in its very Swedish way, has always believed that excellent ergonomic design isn't a privilege.

It's a right.

That it isn't a noble gesture but demonstrably good for business.

It's an attitude that has made Ericsson No. 1 in Europe twice over:

First, as the giant of European telecommunications.

Then again as Europe's biggest workstation company by far.

(You couldn't ask for a better marriage of technology for the future.)

Here is one example of how they got there.

It's the first of a whole range of computers to be introduced in the U.S.A.

The Ericsson PC.
It's Ergo-Intelligent.™

Ericsson has spent $300 million finding ways to make people and computers work better together.

Here are some of the results.

Ergo-Screen.™

Aspirin gets rid of a headache.

Ergonomics gets rid of the cause.

The Ericsson PC monitor has a non-glare screen.

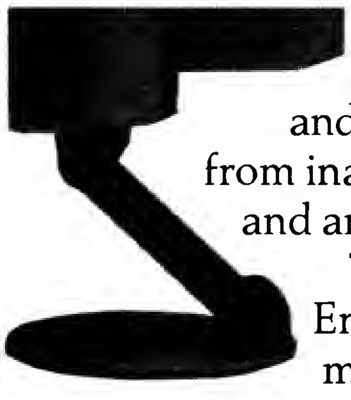
With restful amber characters on a specially developed, low-fatigue background color.

Even the shape of the actual characters was specially developed to allow easier recognition of difficult to distinguish letters like O and Q.

On the monochrome monitor, the resolution is double that of IBM's, so clarity is remarkable.

You can even have characters and graphics on the same screen.

Ergo-Arm.™



Thousands of people get neck and muscle pain from inadequate height and angle adjustment.

The Ericsson Ergo-Arm lets you move your screen exactly where you want it.

Better than back pain, wouldn't you agree?

Ergo-Touch.™

The keys are full-size and the layout is ergonomically planned for greater accuracy and speed.

Yet the keyboard is 20% more compact and less than half the weight of IBM's.

Even the cord is adjustable to suit left- or right-handers.

Ergo-Color.™

Even the color of the case is ergonomically selected to be restful to the eye over many hours.

Ergo-Space.™

The system unit is one-third smaller than IBM's.

It even fits under your desk in a vertical rack.

So your desktop is your own again.

IBM Compatible.

Many companies claim to be compatible.

Some are. Some are stretching the truth.

The Ericsson PC boasts the highest compatibility rating there is.

It's operationally compatible.

You can take advantage of thousands of PC-compatible programs already available.

In fact, with the best-selling software, the program and data disks are interchangeable with those of the IBM PC.

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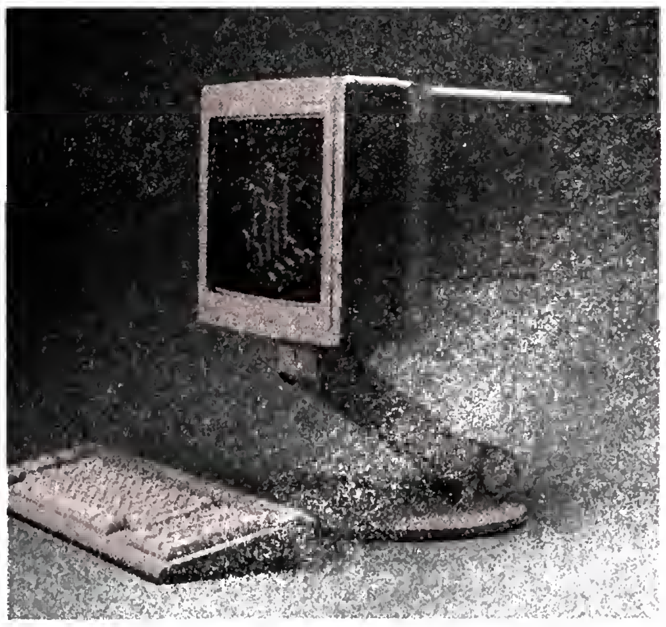


ERICSSON

IBM is a trademark of International Business Machines Corp.

Continued from page 65

According to the vendor, the Quota:100 system includes modules for order processing, confirmation processing, commissions, receivables and sales analysis.

The price of Quota:100 including program diskettes, user manual, function-key template, tutorial and unlimited telephone support for the first month of use is $2,995.

Parlay Software, 4651 Westgrove Drive, Dallas, Texas 75248.

AMERICAN SOFTWARE, INC.
Forethought

American Software, Inc. has announced Forethought, a microcomputer version of its mainframe product group and item forecasting system.

Forethought is a forecasting package for plants and offices. The product provides monthly and yearly forecasts, multiforecasting and item forecasting with up to two item groupings and statistical forecasts with management overrides and simulation capability, the vendor said.

The package runs on an IBM Personal Computer with IBM's PC-DOS operating system.

Forethought costs $9,500.

American Software, 443 E. Paces Ferry Road, Atlanta, Ga. 30305.

SYSTEMS

ALPHA MICROSYSTEMS, INC.
AM-1100E

Alpha Microsystems, Inc. has announced AM-1100E, a desktop microcomputer that runs Alpha's Unimos, a multiuser operating system capable of supporting 11 users.

Unimos is a version of AT&T's Unix System V and supports Unix versions of programming languages such as C, Cobol, Fortran and Basic, according to the vendor.

The microcomputer features a Motorola, Inc. 68010 microprocessor, 1M byte of random-access memory, a 30M-byte hard disk drive, three serial ports (expandable to 11 ports) and a 40M-byte streaming tape backup, the vendor said.

AM-1100E costs $15,585.

Alpha Microsystems, 17332 Von Karman Ave., Irvine, Calif. 92714.

COMMUNICATIONS

TECMAR, INC.
Powerlink

Tecmar, Inc. has announced Powerlink, a microcomputer-to-mainframe communications board for the IBM Personal Computer.

According to a spokesman, Powerlink is designed to emulate IBM 3278 and 3279 terminals that access an IBM mainframe system. The emulations allows a user to access IBM 3270 applications on the mainframe while concurrently running Personal Computer applications. File transfer software enables the micro to access and move large mainframe data bases to the micro. The files can be viewed and manipulated and then transferred to the mainframe or stored on the micro, the vendor said.

The interface board features direct memory access for rapid screen updating, and file transfer is enhanced with batch file support capability, according to Tecmar. Powerlink also features a windowing capability that allows the user to view one host session containing information from a mainframe, one IBM PC-DOS session from the micro and two electronic notepads, the vendor said.

Powerlink is priced at $1,099.

Tecmar, 6225 Cochran Road, Solon, Ohio 44139.

The Software Store
Mastercom

The Software Store has announced Mastercom, a smart terminal and file transfer utility designed for microcomputers running Digital Research, Inc.'s CP/M 80 or Microsoft Corp.'s MS-DOS operating systems.

The product reportedly can connect a terminal to a host time-sharing system, capture data on disk or printer and transfer files with error-correcting protocols.

Mastercom is said to feature directory display, multiple file transmission, file erase, file rename, disk drive logging, automatic dialing, stored responses recalled with single keystroke and file viewing.

Mastercom costs $49.

The Software Store, 706 Chippewa Square, Marquette, Wis. 49855.

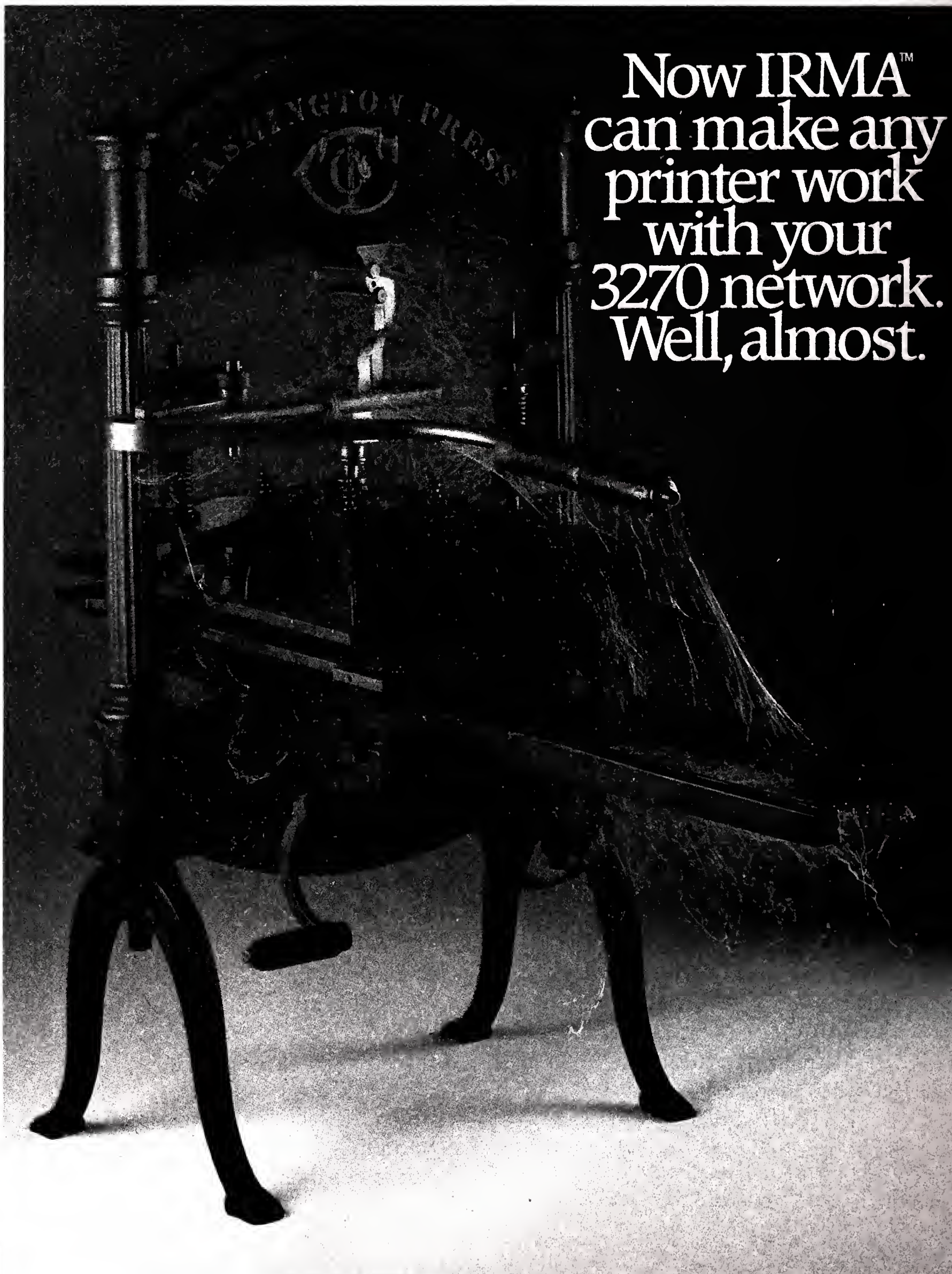
TRIPAS TECHNOLOGIES, INC.
PC Trilink

Tripas Technologies, Inc. has announced a personal computer integration board that reportedly links the IBM Personal Computer, Personal Computer XT or Personal Computer XT-compatible systems with asynchronous terminals and networks.

Trilink is said to give most asynchronous terminals, including Digital Equipment Corp. VT100 terminals, Personal Computer capability without disrupting any element of the existing data processing network. No changes are required to the terminal, host computer or Personal Computer, the vendor said.

The board, which is directly plugged into any expansion slot in the Personal Computer, Personal Computer XT or compatible, allows users to operate aynchronous terminals as monitors on the microcomputer or directly as network terminals, the vendor said.

Trilink is built around a Zilog, Inc. Z80 microprocessor design and operates from two RS-232 interface ports for host and terminal connections. It uses nonvolatile memory to store



Now IRMA™ can make any printer work with your 3270 network. Well, almost.
WASHINGTON PRESS

configuration data, as well as up to 32K bytes of random-access memory, the vendor said. Up to 8K bytes of read-only memory are available for the firmware, the vendor said.

The board is priced at $495.

Tripas Technologies, 37053 Cherry St., No. 203, Newark, Calif. 94560.

NETWORK SOFTWARE ASSOCIATES, INC.

Communications emulators for IBM Personal Computer AT

Network Software Associates, Inc. has announced that its line of microcomputer-to-mainframe communications emulators is now available for the IBM Personal Computer AT.

Products now available for the Personal Computer AT include Adapt SNA 3270, Adapt SNA Printer and Adapt SNA RJE, all of which reportedly emulate IBM terminal products in an IBM Systems Network Architecture (SNA) environment. A fourth product, Adapt BSC 3270, is said to emulate an IBM 3270 terminal in a bisynchronous environment.

The vendor said a main feature of the Adapt series is that the emulators work in conjunction with IBM's existing Synchronous Data Link Control (SDLC) or Bisynchronous Adapter Card for the Personal Computer.

The emulators require IBM's PC-DOS 2.0 or a later version, 192K bytes of memory and an SDLC or Bisynchronous Adapter Card. Prices are $325 for the Adapt SNA RJE and $275 for Adapt BSC 3270. Adapt SNA 3270 and Adapt SNA Printer are sold together for $325.

Network Software Associates, 19491 Sierra Soto, Irvine, Calif. 92715.

HIGGINS

from page 61

vell, Inc. of Orem, Utah. Releases are planned for other networks as well, said Marketing Vice-President Howard Case.

Keeping files private

The network version reportedly includes phone message and electronic mail functions and allows each user to keep any contents of Higgins' files private.

The initial release does not permit two users to view a record simultaneously "because we were not willing to commit to a record-locking technique until IBM announced its network," Case noted.

A second release will provide this feature, he added.

Selling at $395 for a single-user version, Higgins requires a Personal Computer XT or compatible system with 256K bytes of random-access memory and IBM's PC-DOS or Microsoft Corp.'s MS-DOS 2.0 or above. The package also runs on the Personal Computer AT.

Pricing for the network version is based on the number of users, with customers buying a single copy and distributing it over the network.

A version supporting up to seven users will cost under $1,500, Case said.

Conetic Systems is based in Portland, Ore. More information on the network is available from the company's Office Automation Group, which offers Higgins, at 1470 Doolittle Drive, San Leandro, Calif. 94577.

AT

from page 61

ever, not only individual users but vendors, DP staff and other computer professionals are complaining of flaws.

"We've got four in, and three are bad," noted one micro manager at a Fortune 1,000 firm. In addition to power supply malfunctions, "the disk drives are flaky," he said. "The half-heights [floppy drives] are very tempermental, even when they are working, and the hard disks have problems too." The hard disk drives are likely to be damaged in shipment because IBM neglected to fully emphasize the complete preshipment procedures, he said.

The manager also described the AT as a good machine overall and said that he expects IBM to quickly fix the product flaws, improve documentation, supply a full range of related equipment in quantity and boost support in general. His firm currently intends to buy more ATs for specialized applications such as computer-aided design.

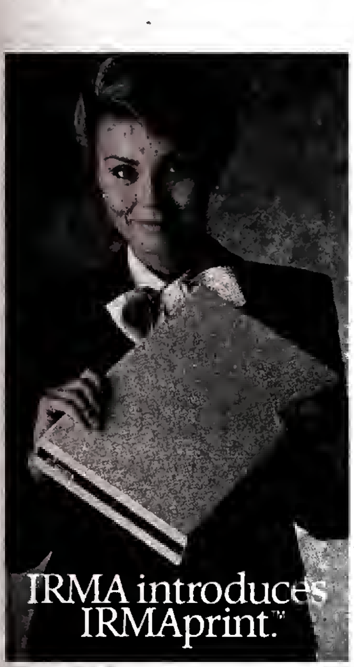
Many other DP/MIS executives also gave lukewarm reviews to the AT in its current incarnation.

"For some applications, we like it, and we're beginning to buy it," said Ronald Jenks, director of information services at Touche Ross and Co. in New York.

But, like others, his firm is not yet buying the AT for general use. "We're holding off, waiting for some of the weaknesses to be fixed," he said.

Volkswagen of America, Inc. in Warren, Mich., which originally considered replacing Personal Computer XT orders with purchases of the new machine, is also postponing acquisitions, according to information center manager Warren Kress. "We're experimenting with two units, trying to identify the glitches."

Unlike the case with Qsborne, everyone expects IBM to solve the AT's problems quickly and thoroughly. But until that happens, the next generation machine won't reach hyperspeed.



When you set up an IBM® 3270 network, you're faced with the fact that you can't just go out and buy any printer to work with it.

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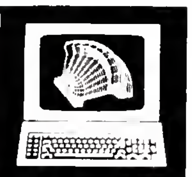

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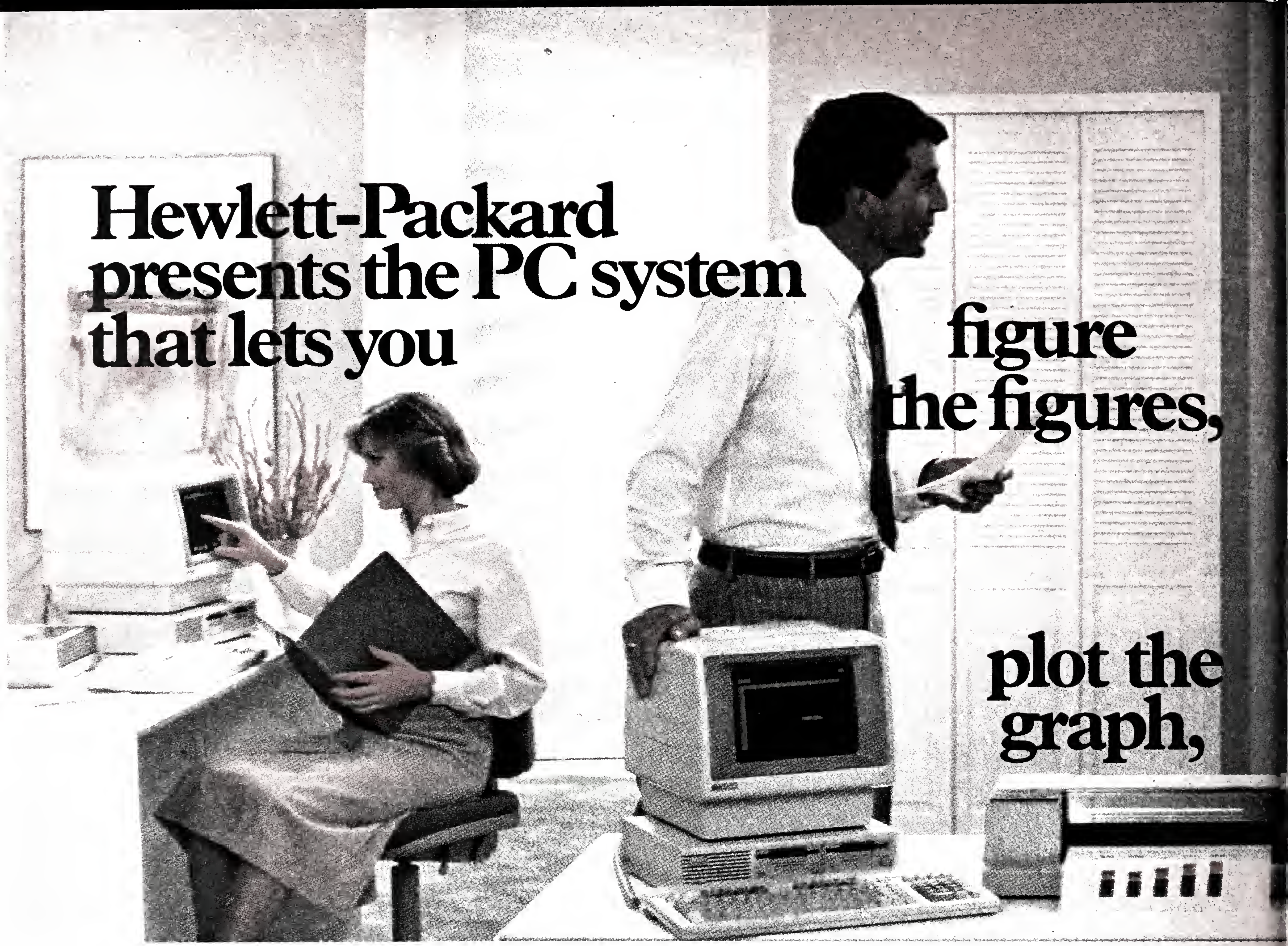

Hewlett-Packard presents the PC system that lets you figure the figures, plot the graph,

The key word in that long, drawn-out headline is system.

A system built for PCs.

At Hewlett-Packard, it's a quality system of personal computers, plotters, a truckload of software, and Local Area Network (LAN) capability.

It's all matched and designed to work brilliantly together.

Yet the system is so flexible each part can stand alone. Or even team with an IBM PC.

So you can build just the system your staff needs.

It all starts with two of our Hewlett-Packard personal computers.

We call one the HP Touchscreen and the other (because it can do even more) the HP Touchscreen MAX.

The first comes with two double-sided disc drives that give you 256K bytes of main memory, expandable to 640K bytes.

The HP Touchscreen MAX has even more capacity, with the added power of a 14.8M byte Winchester disc drive.

And both have DSN/Link, to let you set up a direct line of communication between them and your HP 3000 Department Computer.

As the names imply, you can actually change things on either screen just by touching the screen.

That makes the Touchscreen PCs easier to use. And a lot easier to learn.

The system also includes two printers many people think are simply the best around.

Our Hewlett-Packard LaserJet and ThinkJet printers are both breathtakingly fast and refreshingly quiet.

The ThinkJet printer runs at a rapid 150 characters per second.

Yet because the ThinkJet paints each character with a small jet of ink (instead of smashing the paper with keys), it's as quiet as a sigh.

At 300 characters per second, our LaserJet printer is even faster.

Ten times faster than the best daisy-wheel printers. Yet the image is as sharp as you'll get from a printing press. Amazing.

and when you get to your hotel, change everything.

Two different plotters are also part of the HP personal computer system.

Both create full-color graphics. One with two pens, the other with six for even more detail.

If you like, the system can be knitted together through a LAN.

It lets a number of HP personal computers link up, talk to each other, share printers, and exchange information.

By the way, there can be a lot of information to exchange. That's because there are more than 500 business software titles available. For word processing, accounting, spread sheets and graphics. You'll find the big names there, too.

1-2-3™ from Lotus™ * WordStar™ ** MicroPlan™ *** And the whole catalogue of software from HP.

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Hewlett-Packard's portable personal computer turns your hotel room (or your den at home, or your customer's desk) into another part of your personal computer system.

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WRITERS

from page 61

staff to outside classes. Other companies will have one employee trained and then allow that employee to train others.

These methods will work, of course. Most people can learn to use a computer to perform the job in question if given sufficient incentive and training.

Unfortunately, because of the complexity of the programs, it can take many hours of unproductive attempts before a computer novice learns enough to be effective.

Still more time will be wasted if the person does not know a few basic rules of computer usage. For example, few novices know that a disk is magnetic, and that exposure to magnetic fields can destroy the disk's contents.

An in-house technical writer can help bridge this communications gap.

Businesses often employ a staff writer, whose job may be anything from creating brochures or newsletters to writing technical product descriptions. With training and experience, these writers can become technical writers, creating simple instructions that will ease the transition to computer methods. In particular, technical writers can be of invaluable assistance to novice users.

Getting started

To get started, the writer first must have access to the computer and the software and time to become familiar with both. If the writer previously has done no technical writing, he might enroll in a local technical writing course.

Once familiar with the hardware and software, the technical writer can begin creating simple sets of instructions.

A good technical writer, faced with educating a novice user about a computer, will not assume anything.

Computer installation

The writer first should know if the computer is completely installed and ready for use or if the user must perform this task. If the user is expected to install the computer, then the technical writer can take the manufacturer's installation instructions and simplify them into steps. For example:

■ **Step 1.** Find the packing slip and check to be sure you have all the parts that are listed. If any are missing or seem different from the list, call vendor department, person and so on.

■ **Step 2.** Be sure the desk (table) for the computer is near an electrical outlet. Carefully unpack the display screen, keyboard, disk drives and printer. You will also find two cables, labeled (A and B). Next, look at the display page in the owner's manual. Note that the screen is placed on top of the disk drives, the keyboard is in front of them and the printer is to the side. (You may place the printer on either side.)

Simple lists

This example may seem too simple, but when a user unfamiliar with the electronic equipment needs to get it working, it is easier to follow such simple lists than to try to find the proper page in the manual and then interpret more intricate instructions. Also, novices are less intimidated by instructions from a person than from a manual.

Once the computer is hooked up, the technical writer can then instruct the new user to:

■ **Step 1.** Find the disk labeled 'System Master.' (It should be in the back of your owner's manual.) Note the distinguishing characteristic such as a label or a tab. Insert this disk in Drive A of your disk drive (the left-side drive slot) with the tab or label up. Push gently until the disk is totally inserted; you will hear a soft click. Remember to handle your disks carefully.

■ **Step 2.** Turn on the computer. The switch is located on the right underside of the keyboard. There will be a slight humming noise, and the small red light under the left disk will flash on and off. When the computer is ready to operate, your screen will display a message.

Again, this may seem simple, but the simpler the instructions, the faster the user will get over any initial uncertainty.

The technical writer can use the same skills to lead the user through the steps necessary to get a software program into the computer and ready to run. At that point, the user can be assisted with finding and interpreting the manual's instructions.

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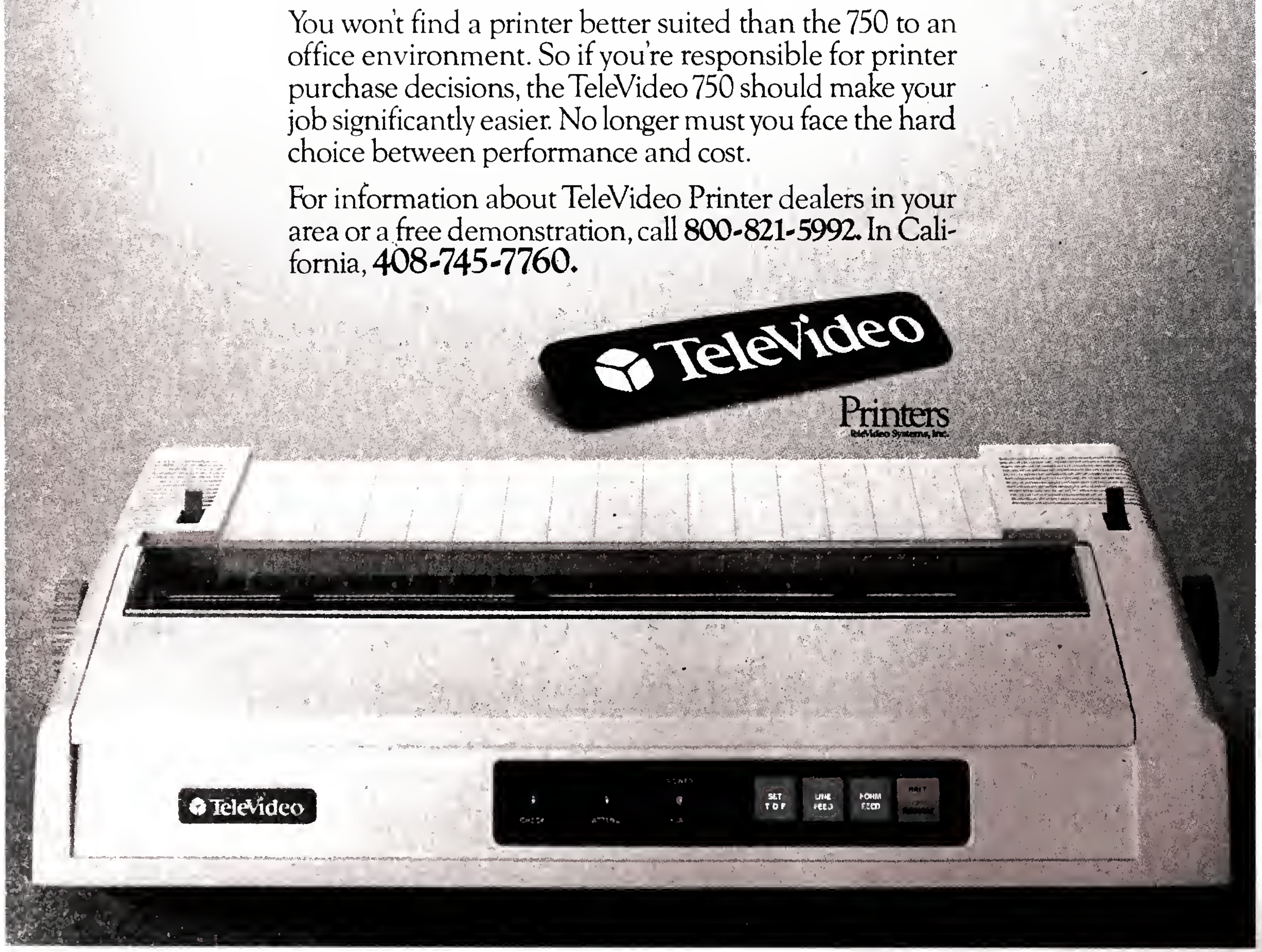

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COMPUTER INDUSTRY

Seagate gears to ride out shaky mart

COMPANY PROFILE
Kathleen Burton
CW West Coast Bureau

SCOTTS VALLEY, Calif. — Seagate Technology, Inc., the leader for five years in the booming single-user, hard-disk drive market with a 45% market share, faces an exceedingly difficult year ahead.

Caught in the crosscurrents of an industry reeling from shortened product life cycles, a soft microcomputer market, a trend to overseas manufacturing and the unpredictability of its major customer, IBM, Seagate's future is uncertain.

"The disk industry is in the midst of a shakeout," Seagate founder, Chairman and Chief Executive Officer Alan F. Shugart said in a recent interview. "Within two years, we'll only see six companies left in this business and maybe two leading suppliers."

To survive these troubled times, the company must compete with domestic vendors and the Japanese to gain market share in next-generation products built around sub-5¼-in. and half-height, high-capacity micro Winchester drives.

"Seagate faces a critical time window," said James Porter, editor of "Disk/Trend Report," an industry newsletter published in Mountain View, Calif. The company must ramp up new products to recoup recent capital expenditures and get those products into the market for systems designers, notably IBM, Porter said. "Seagate should have begun production on half-heights, 20M-bytes and 3½-in. drives six months ago," he asserted.

Other serious problems lie ahead for the company. Prices, already plummeting 30% annually, are predicted to drop even further, sparked by a cutthroat price war led by Tandon Corp., a new entrant in the hard-disk market, that is expected to undercut Seagate's mass-market 10M-byte product by $100. Seagate is also plagued by chronic production problems, Porter said, chiefly an inability to get product plans into production rapidly and a tendency to announce products, such as the ST206 half-height, that are never shipped.

Amid those market uncertainties, Seagate in mid-November undertook a major reorganization, which resulted in the resignations of several key sales and marketing executives. Shugart said the reorganization will provide customers and distributors with quicker access to the company by lessening the levels of in-house bureaucracy. The present reorganization followed an earlier management shake-up in July, which resulted in the abrupt departure of company cofounder and ex-vice-chairman Finis T. Conner. Shugart has become more involved in the company's day-to-day sales and marketing operations since then.

But industry analysts said Seagate is not without important strengths. The company has maintained excellent long-term relationships with more than 200 OEM customers, including heavyweights such as IBM, Digital Equipment Corp., Hewlett-Packard Co., Honeywell, Inc. and AT&T, and has acquired a reputation as a volume supplier with an annual production capability of two million units. To keep manufacturing costs low, Seagate also has a foreign source for every part except disks, which are purchased in the U.S.

See **SEAGATE** page 76

■ Datapoint Corp. took further steps to cut costs amid reports that the company has caught the eye of Asher Edelman of Management Assistance, Inc. and Mohawk Data Sciences Corp./**79**

■ Advanced Micro Devices, Inc. became the latest semiconductor manufacturer to halt shipments of military-destined components pending investigation of testing procedures/**81**

■ Texas Instruments, Inc. recently announced it is cutting 2,000 positions/**84**

Robots: Orders up, prices down

By Mitch Betts
CW Washington Bureau

WASHINGTON, D.C. — Shipments of robots from U.S. suppliers to users in 1984 will amount to about $290 million, a 50% increase over the 1983 level, as unit prices dropped about 20%, according to officials of the Robotic Industries Association (RIA).

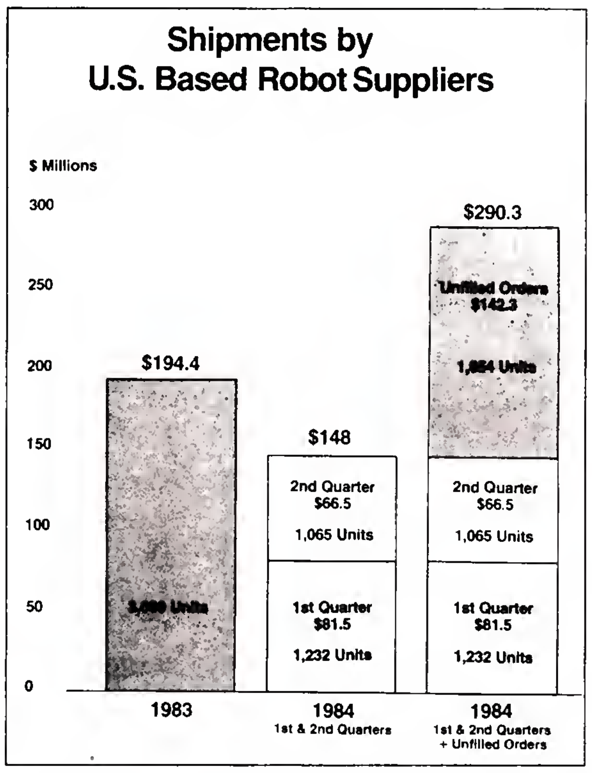
"The numbers reflect the fact that American industry now recognizes the need to modernize its manufacturing processes by the use of industrial robots," according to Walter K. Weisel, RIA president and president of Prab Robots, Inc., a manufacturer in Kalamazoo, Mich.

The RIA released its new figures — the first hard statistics ever generated by U.S. robot manufacturers — at a press conference here earlier this month. The U.S. trade association has an all-time high membership of 320 firms, including robot users such as the major automobile manufacturers as well as robot equipment manufacturers and researchers.

Weisel and Donald Vincent, RIA executive vice-president, said the new customer base for robots has expanded from automotive industries to encompass the textile, materials and product handling, aerospace, medical, furniture, electronics, construction and defense industries as well. Robots typically improve productivity by 20% to 30%, they said.

The RIA's statistical survey showed that $148 million worth of robots were shipped in the first half of 1984, with a backlog of unfilled orders amounting to $142.3 million. Combining the two figures,

See **ROBOTS** page 88



ROBOTIC INDUSTRIES ASSOCIATION CHART

INDUSTRY INSIGHT
David Olmos
CW Staff

Engineering teachers feared in short supply

As the U.S. computer industry struggles to remain king of the technology hill amid challenges from Japanese, European and other up-and-comers, a continuing dilemma is the education of electrical and computer science engineers. The question is often raised: Will there be enough engineers to meet the needs of the industry, and how well-trained will they be?

The American Electronics Association (AEA) and assorted forecasting groups are predicting

See **AEA** page 88

IBM, NCR Comten to meet in court

Copyright violation countered with antitrust charges

By Kathleen Burton
CW West Coast Bureau

LOS ANGELES — IBM and NCR Comten, Inc., a division of NCR Corp., will square off this month in a legal battle over the alleged disclosure of proprietary information by a computer consulting firm.

The charges, which will be heard in federal courts here and in Minneapolis, indicate the measures many computer companies, including IBM, will take to protect their computer secrets. The countercharges subsequently brought by St. Paul, Minn.-based NCR Comten against Evergreen Consulting, Inc., a consulting firm based here, also focus on the question of how much material from competing companies consultants may disclose to their clients.

A preliminary injunction hearing today in Los Angeles' 9th Circuit Court will determine whether NCR Comten will be prohibited from using a program it is alleged to have unlawfully copied from IBM. The dispute began in 1980 when IBM hired Evergreen to evaluate products that competed with IBM's 3705 communications processor, which is a gatekeeper for information entering mainframes.

In carrying out the evaluation, Evergreen discovered that segments of the software used with NCR Comten's communications processor were identical to IBM's Advanced Communications Function/Network Control Program. Evergreen procured a copy of the NCR Comten program and relayed the alleged copyright infringement information to IBM.

In 1981, IBM notified NCR Comten that the program infringed on IBM's copyright and demanded a $74,000 payback for the alleged misuse. NCR refused, and the legal sparring began in November 1982, when NCR Comten brought suit in a federal court here against Evergreen, charging that the company had disclosed proprietary information

See **COURT** page 84

ALAN F.
SHUGART

Alan F. Shugart, founder, chairman and chief executive officer of Seagate Technology, Inc., has nearly 30 years of experience designing computer peripherals and systems; he spent 18 years with IBM as a field engineer, was subsequently vice-president of product development at Memorex Corp. four years and, in 1973, founded Shugart Associates, a floppy disk drive company that Xerox Corp. later purchased. In a recent interview with Computerworld *West Coast correspondent Kathleen Burton at Seagate's Scotts Valley, Calif., headquarters, Shugart discussed IBM, Seagate's biggest customer, and talked about the emerging markets that will drive the volatile rigid-media market in 1985.*

Q ***What's going to happen in the rigid disk market over the next two quarters?***
The disk industry is in the midst of a shakeout. Within two years, we'll only see six companies left in this business and maybe two leading suppliers.

The other companies will go broke, get acquired or enter small, niche markets with low volumes. I don't see any improvement over the next two quarters either, because the same conditions will exist in the marketplace.

Q ***What's driving this shakeout?***
There's been a slowdown in user acceptance of desktop computers. This industry goes where the small-computer industry goes. I predict a resurgence in the small-computer systems market, however, driven by more computing power and lower costs. Seagate's low cost structure for large rotating memory devices will help fuel this revitalization.

Q ***How are Seagate's fortunes tied to IBM's?***
IBM is our largest customer, representing almost 60% of our business.

Obviously, we have a very good relationship with IBM.

Q ***Is this a frightening position for Seagate — to be this dependent on IBM?***
Absolutely, but the alternative is more frightening. The minute you're not scared in this business, you're doomed.

Q ***What do you think of IBM's ability to set standards in the industry? Is this good?***
If it weren't for IBM, we wouldn't have any standards, not even an 80-column card.

It's not the standard itself that's important, but the fact that IBM can dictate that a standard exists. I think that's a great thing. The industry is incapable of doing it itself.

Q ***What specific problems lie ahead in 1985?***
A price war will be sparked by the industry-wide move to [foreign] manufacturing and the entrance of Japan into the 3½-in. market. This will drive a lot of marginal suppliers out of business.

Q ***Are you worried about this Japanese competition?***
No. Floppy disk technology is now 11 years old, and the Japanese have won 80% of that market. This is because the technology leveled off, and the Japanese did what they do best — automate production.

The technology curve for rigid drives is still too steep for this to happen here though, and product life cycles are still too short. The Japanese can't beat us at competitive cost structures either, because they build [overseas] just like we do.

Another subtle deterrent to the Japanese is the complicated nature of the disk drive interface. It's a harder interface to duplicate than those on watches, cameras or printers.

The Japanese also face two major problems in selling products to U.S. systems manufacturers: the high levels of technical support required and Japan's historic inability to perceive why its "perfect products" don't always work in a customer's system.

Q ***What technical problems will Seagate address in the future?***
We'd like to participate in two emerging markets. As capacities increase, the hard-disk backup issue becomes more critical.

Most MIS directors at Fortune 1,000 companies are very worried about backing up their personal computers. The best solution now is [with streaming tape drives], which isn't very cost-effective.

Also, as products with a gigabyte of networked storage become common, it's impossible to archive using floppy disks. Maybe optical storage is the solution .

Vendors view IBM contracts as precarious blessings

COMPANY PROFILE
Kathleen Burton
CW West Coast Bureau

Industry observers say the sharp dip in Seagate Technology, Inc.'s sales is due to a slowdown in orders from IBM, which, as Seagate's largest and most influential customer, accounts for 59% of the company's sales.

"This is an OEM business, and all disk companies will rise and fall with their customers' whims, notably IBM's whims," said Dave Claridge, senior analyst at investment banking firm Hambrecht & Quist in San Francisco.

"IBM did a sloppy job of planning its future requirements and is whipsawing its vendors — including Seagate — all over the place now," said James Porter, publisher of "Disk/Trend Report," an industry newsletter published in Mountain View, Calif.

According to Porter, IBM plans to ramp up to produce internally 100% of the 3½-in. and high-capacity 5¼-in. products destined for the Personal Computer AT.

IBM is also shopping among domestic vendors for 10M-byte and half-height 20M-byte products for the Personal Computer XT, according to Porter.

Negotiations are also under way between IBM and two Japanese vendors, Alps and Toshiba Ltd., for 3½-in. floppy disk products reportedly scheduled for IBM's portable computer, Porter added.

Winchester contracts follow

"You can bet that where floppy contracts go, Winchester contracts will follow a year later," Porter said.

"Having IBM as a major customer is a mixed blessing," said Bill Frank, a senior analyst at Infocorp, a market research firm in Cupertino, Calif.

Companies that frenetically ramp up for IBM's 18-month contracts and neglect their other customers have no guarantee that IBM will stay around when the contract expires, he said, adding, "dealing with IBM is very precarious."

Seagate to tap Asian mart
Manufacturing strategies fuel sales drive

Vertical integration and automated offshore manufacturing are two trends sweeping the hard-disk industry.

Both are necessary steps to meet the aggressive pricing environment predicted for next-generation products, said Tom Finnegan, Seagate Technology Inc.'s director of international sales.

"Our intention is that all volume production will eventually be done offshore," Finnegan said, "but we're taking it one step at a time."

Untapped markets

Bob Toda, Seagate's director of Far East Marketing, said the company plans to push into the virtually untapped Japanese and Far Eastern markets during 1985.

To ramp up for this move, Seagate recently expanded its 41,000 sq-ft offshore operation in Singapore, which supplies printed-circuit boards, head assemblies and drives for shipment to Europe and the Far East.

This gives the company a foreign source for every part used in its products except disks, which are still manufactured in the U.S. Toda said Seagate also hopes the offshore distribution network will woo major U.S. customers that have recently moved production operations overseas.

Company Chairman Alan F. Shugart explained the company's interest in the Japanese market: "With the word processing and data base business applications developing rapidly in Japan and the massive storage requirements of the Kanji language, the Japanese will be major purchasers of 20M-byte-plus products. They'll skip the 10M-byte market completely. Japan has the second largest market potential for rigid media after the U.S., and we plan to be there."

Seagate began its marketing and selling thrust in Asia two months ago, Finnegan said, by establishing procurement offices in Tokyo and Taipei, signing distribution agreements in Korea, China, Hong Kong, Singapore and Malasia and negotiating with Japanese suppliers..

Seagate also began to accelerate its vertical integration strategy last year, he said, acquiring Grenex, a California company that develops sputtered thin-film magnetic media, an eventual means to increase disk storage.

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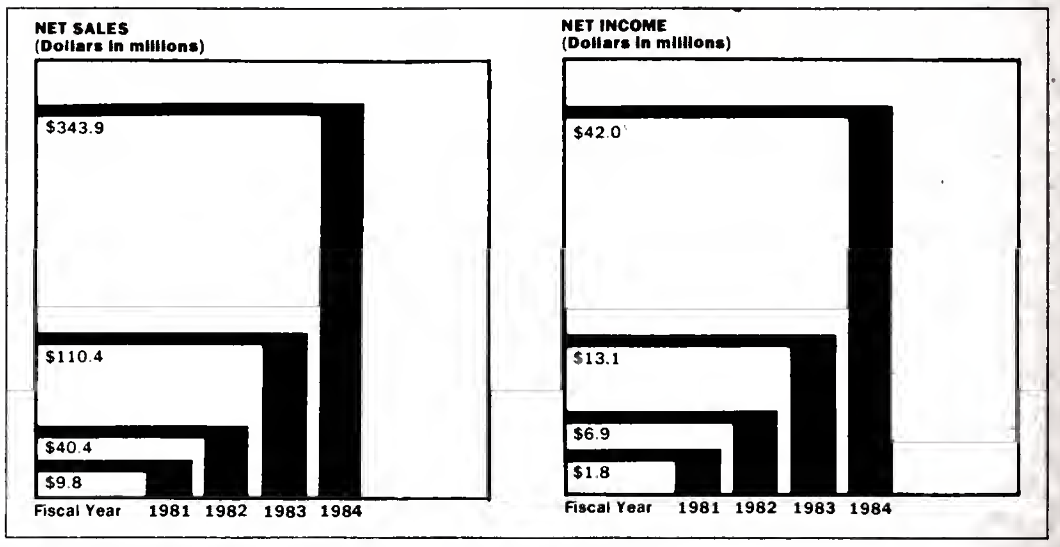

Seagate Technology, Inc.'s financial performance

SEAGATE

from page 73

Industry watchers also said the rigid media industry is basically healthy and will rebound, based on the market's acceptance of integrated software, AT&T Unix-based applications (requiring higher capacity products) and a revitalized personal computer workstation sector.

However, Seagate must contend with a hard-disk market that is branching in two different directions, according to David Claridge, a senior analyst at the venture capital investment firm of Hambrecht & Quist. The direction is toward smaller, lower cost drives for the transportable and single-user market and to full-size, higher performance drives destined for multiuser systems, he said.

Seagate is addressing both markets with recently announced products, claimed Doug Mahon, Seagate's senior vice-president and chief technical officer. Presently in the works are a drive for the IBM Personal Computer AT, a family of 3½-in. products (perhaps destined for IBM's portable computer), several intelligent disk drives that allow the drive's controller to communicate with the CPU and a high-capacity line of 5¼-in. voice coil products.

Rags-to-riches story

Seagate's corporate history is a classic Silicon Valley rags-to-riches story. In 1979, Connor approached Shugart, then president of a floppy disk drive company he had founded called Shugart Associates, predicting an exponentially growing market would emerge for hard disk drives among microcomputer users. Shugart, Connor, Mahon and Thomas Mitchell founded Seagate in November of that year and, in 1980, shipped $10 million worth of 5¼-in. rigid disk drives, offering six times as much storage and access times 1½ times faster than floppy disks.

The market took off and, by 1982, 8% of the microcomputers sold were equipped with hard disks. In 1983, the steep growth curve continued — Seagate shipped 200,000 drives and posted revenues of $110 million.

But by the second half of 1984, the boom ended. Seagate's sales plunged from $100 million to $50 million. The company remained profitable, however, raising cash-on-hand from $13.7 million to $29.7 million and boosting equity to $165 million.

To ride out the slowdown, Seagate is carefully guarding its resources. In October, recently appointed Seagate President and Chief Operating Officer David Mitchell said the company, which laid off 700 employees last July, has frozen hiring and will sell a never-used manufacturing facility in Watsonville, Calif.

"We definitely [have] no cash flow problems," he said, alluding to a $40 million multibank line of credit.

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New high-tech firms boast third-quarter growth in

OUTSIDE LINES
Bohdan Szuprowicz

Bankruptcies, layoffs and liquidations have intensified among high-technology firms in recent months, but at the same time more new firms than ever before showed a spectacular growth performance in earnings and revenues.

Storage Technology Corp. became the largest computer company ever to file for Chapter 11 of the Federal Bankruptcy Act, yet at least 30 rapidly growing, publicly owned firms have seen their revenues increasing by at least 100% during the third quarter of 1984, compared with the same period in 1983.

Twenty-two of those firms — over a third more than a year ago — also registered simultaneous increases in earnings per share (EPS) of more than 100%, which sets a record since 1983 when we began keeping track of such superperformance.

Absence of micro software

What is significant about those top performers this quarter, however, is the virtual absence of microcomputer software or even minicomputer disk drive manufacturers that often dominated this list in previous quarters. This time, the fast-growing firms are primarily in semiconductor-related and telecommunications-based industry segments, with just a spattering of firms from among peripherals and memory-media suppliers.

Micron Technology, a small start-up that took on the Japanese in cutthroat competition for a share of the 64K-byte random-access memory semiconductor market, made it to the top of our list this quarter with a spectacular performance, increasing its EPS by 2,900% and continuing similar growth levels during the second quarter of 1984, which earned the firm second place on our list three months ago.

The company went public in June 1984 at $14 per share and rose as high as $40 per share in the aftermarket, making it one of the year's best-performing initial public offerings.

Lam Research Corp., which also made our list for two quarters running, is perhaps not widely known, but the company represents a new crop of manufacturers in the critical plasma-etch equipment industry, which is vital for expanding very large-scale integration (VLSI) microchip production. The company is at the cutting edge of the VLSI revolution, which is now gathering momentum and will drastically change the semiconductor industry.

Advanced Micro Devices, Inc. and SEEQ Technology, Inc. are two other semiconductor manufacturers on our list, and Mentor Graphics Corp., Valid Logic Systems, Inc. and Daisy Systems Corp. are the big three suppliers of computer-aided engineering (CAE) workstations and design systems that are making custom and semicustom VLSI products an economic reality.

Among the top-performing firms in the general area of telecommunications, 3Com Corp. and Ungermann-Bass, Inc. are the first two public local-area network manufacturers whose appearance on this list underscores the rapid growth of local-area network markets that has been under way for the last two years. Optronics and Fibronics International, Inc., on the other hand, represent an even faster growing segment of electro-optical systems and components — many of which end up in fiber-optic local-area networks, robotic systems, artificial vision and factory automation, where specialized industrial local-area networks are among the fastest growing of all high-technology markets today.

VMX, which markets voice mailboxes used as electronic answering services, began shipping its systems to large corporate cli-

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revenues, earnings in period of increased casualties

ents and major telecommunications equipment and service suppliers. It was the first of the voice store-and-forward equipment and services suppliers to go public last year and appears to be growing rapidly in a new market segment. Equatorial Communications Co., which makes small earth stations for low-cost satellite communications networks, became an instant hit with institutions when it went public a year ago; now almost 50% of its stock is in institutional portfolios. COM Systems is a manufacturer of computerized telephones; Digital Communications Associates, Inc. is a leading independent supplier of large data communications networks; and Walker Telecommunications provides marketing, engineering and other services to the industry.

Of the remaining top performers, Apollo Computer, Inc. needs no introduction. It has already earned itself a place as one of the biggest successes ever since going public in early 1983. Apollo

Apollo is now clearly among the new leaders in 32-bit supermicrocomputer or workstations product categories and its future remains very bright, provided it moves fast enough to keep ahead of the VLSI-driven competition.

Quality Micro Systems, Inc., among the original independent laser printer suppliers in the U.S., has made our list because the nonimpact printer segment of the market is soaring, particularly with the strong growth in the laser printer niche.

Computer Memories, Inc.; Xidex Magnetics, a subsidiary of Xidex Corp.; and Wyse Technology, Inc. round off the list of top performers.

Szuprowicz is president of 21st Century Research of North Bergen, N.J., and publisher of Supergrowth Technology USA.

Datapoint consolidates to cut costs

SAN ANTONIO — Datapoint Corp. recently announced further moves to consolidate its operations, and it was further reported that the company's management faces intervention from an investor who was responsible for altering strategies substantially at two other computer vendors earlier this year.

The company, which experienced a 73% decline in profits to $1.5 million for the quarter ended Oct. 27, said it would combine the manufacturing activity from its Fort Worth, Texas, plant with its plant here and would close the Fort Worth plant effective Jan. 31.

A spokesman for the company also said it was lengthening by several days the traditional holiday season production shutdown.

The Fort Worth closing will enable the company to reduce overhead costs of manufacturing operations and to bring production and inventories in line with demand, according to a spokesman.

The holiday shutdown extension, from Dec. 17 to Jan. 4, lengthened from the normal shutdown of Dec. 21 through Jan. 2, will permit the company to balance the output of its work force with product demand pending the Fort Worth closing, the spokesman said.

Meanwhile, *The Wall Street Journal* reported last week that investor Asher B. Edelman was expected to file with the Securities and Exchange Commission notification that he holds shares and options totaling nearly 10% of Datapoint's stock.

The newspaper reported that anonymous sources said Edelman will attempt to influence management or take control of the company.

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IBM to face marketing, productivity challenges by

By John Desmond
CW Staff

TARPON SPRINGS, Fla. — Because IBM's manufacturing costs, as a percentage of revenue over a 13-year period from 1976 to 1989, will rise by 9%, selling expenses must be shaved by an equivalent amount to meet profit targets.

This scenario was outlined by Gartner Group, Inc. vice-president Stephen P. Cohen at a conference for IBM large-systems users here recently.

According to the Connecticut-based market research and consulting firm, costs increased from 36% of revenue in 1976 to an estimated 41% in 1984 and a projected 45% in 1989.

Will not cut R&D

IBM will not cut research and development budgets, since it must compete with such potential threats as the Japanese firms and AT&T.

Cuts will be made from selling and general administration expenses, a marketing and productivity challenge for IBM, said Cohen, Gartner's director of Industry Service and a former IBM strategic planner.

Gartner Group estimated that IBM plans to cut selling expenses from 18% of income this year to 15% in 1989 and to cut general administrative expenses from 9% to 7% in 1989, Cohen said. Expense as a percentage of revenue is targeted for a reduction from an estimated 35% this year to 30% in 1989, he added.

Staffing expenses to rise

The expense burden of the marketing staff, estimated to be $110,000 per person this year, is projected by the Gartner Group to rise to $140,000 per person in 1989 if the expense is held to the rate of inflation.

The estimated revenue generated per member of the marketing staff, $613,000 this year, would have to rise to $929,000 to meet IBM objectives, Cohen said. That rise would be equivalent to a 52% improvement in five years. "That's the challenge IBM is facing," Cohen said.

This challenge assumes that IBM will keep pace with a projected 18% annual industry revenue growth and can hold its sales expenses per man-year to inflation. If IBM fails in either objective, its sales force would have to generate even greater than 52% improvement, Cohen said.

"Either IBM's profitability will suffer and [it] will not achieve [its] objective, or IBM will not be able to price [itself] as competitively as [it] would like and [it] will not be able to achieve the market share [it] would like," Cohen said.

"All strategies IBM has embarked on in the area of selling, administration, service and manufacturing are oriented around achieving that productivity," he added.

Methods for strategies

Among methods to achieve the strategies, Cohen said, IBM will employ the following:

- ■ It will use its direct sales force only for big-ticket customers, promote long-term commitment through account plans (suggested long-range growth paths), presell products with more statements of direction and automate elements of the sales cycle.
- ■ It will use alternate marketing channels for smaller customers, trying to lower the cost of selling. "If you can't eliminate selling expense entirely, the next best thing is to do that selling with a lower paid person," Cohen said.
- ■ It will design products to minimize selling expense, with features including ease of use for end-user products and standard user interfaces to lower training and support expenses.
- ■ It will design products for improved reliability, availability and serviceability. Improved diagnostics and field-replaceable units will aid this goal, Cohen said.

Another way for IBM to reduce service expenses would be to absorb unneeded field engineers elsewhere in

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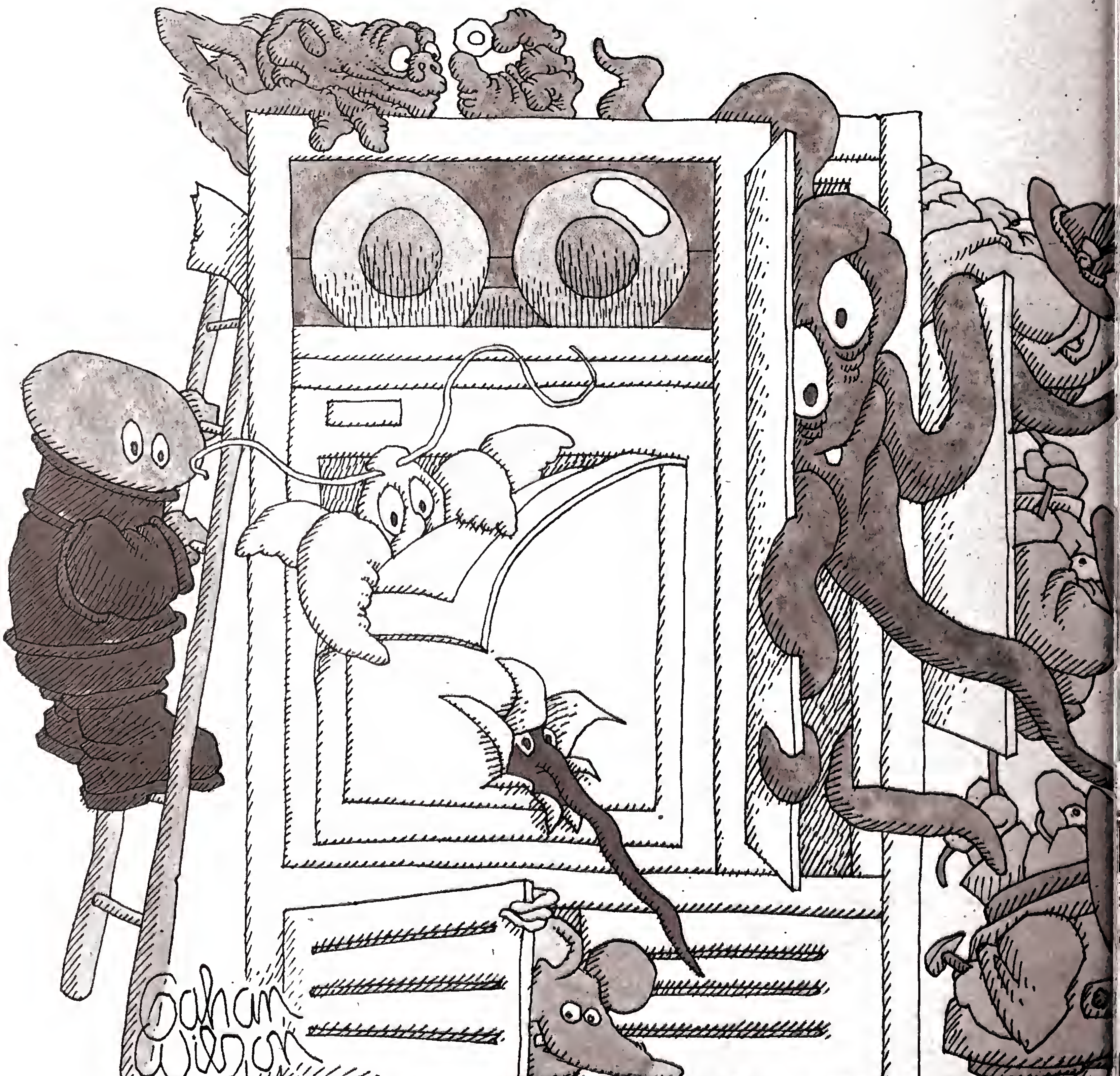

PROTOCOL. THE END OF THE

trimming budget, 9% rise in expenses

the company, Cohen said. But, he added, IBM will go slowly in moving its field engineers out of fear the engineers might form a union.

In manufacturing strategy, IBM will turn to the OEM market more in order to spread costs over a bigger base, Cohen said, pointing to the recent agreement between IBM and Honeywell, Inc. to market older IBM mainframes as one example.

'IBM will get more aggressive'

The Gartner Group projected that IBM's long-term revenue growth rate will be 16% annually; thus, IBM will lose market share if industry revenue grows at an 18% annual rate. Meanwhile, the market share of the Japanese is increasing, Cohen said. As a result, "IBM will get more aggressive," he said.

The aggressiveness could result in products with little competition being priced higher, software prices increasing rapidly and software fees being based on usage rates, he suggested. IBM now has decision support software with a price based on the number of signed-on terminals users, he noted.

IBM will use financial muscle to block competition and penetrate new markets, he said. When competition emerges, IBM will drop prices to try to thwart it, he said, noting the experiences of Storage Technology Corp. and Control Data Corp. in the disk drive business.

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CW12/17/84

AMD halts DOD chip shipments

By David Olmos
CW Staff

SUNNYVALE, Calif. — Advanced Micro Devices, Inc. (AMD) recently suspended the shipment of certain integrated circuits to U.S. Department of Defense contractors after an internal audit discovered discrepancies between the company's testing procedures and those of its contractors.

Advanced Micro, a semiconductor manufacturer, said shipments will not resume until the company can determine that its testing procedures are meeting customer specifications. Deliveries of the chips were halted Dec. 1.

"The inconsistencies were discovered as part of a special audit of all customer special test specifications following discovery of similar situations at several other manufacturers of integrated circuits," said Jim Lynch, vice-president of quality assurance and reliability.

The Advanced Micro action is the latest in a series of testing irregularities at major manufacturers of military chips. Earlier this year, Texas Instruments, Inc. and Signetics Corp. reported testing problems, and Schlumberger Ltd.'s Fairchild division has notified the Department of Defense that some of the chips it supplied to contractors may have been improperly tested.

A spokesman for Advanced Micro said the company has not been informed of any disciplinary action by the Defense Logistics Agency, the Department of Defense's procurement unit.

The spokesman said the chip testing question "has brought about a complete review of everything. All these occurrences have prompted everyone to look a lot closer" at test procedures, he said.

Last March, National Semiconductor Corp. pleaded guilty to federal charges that it falsified test data for chips supplied to the military.

Advanced Micro said shipments of joint Army-Navy products and standard catalog products were not included in the suspension. The company said after its Dec. 4 announcement that it expects to complete a review of its testing procedures within 120 days. "We think we can do it by then," a company spokesman said.

A company spokesman said it will immediately resume shipments to customers where no inconsistencies are found.

Tandon files patent complaint

By David Olmos
CW Staff

CHATSWORTH, Calif. — Tandon Corp. has filed a complaint with the U.S. International Trade Commission charging three Japanese companies and their American subsidiaries with infringement of a patent covering floppy disk drive technology.

In its action, Tandon, a disk drive manufacturer based here, is seeking an investigation into the alleged infringements and an order barring future imports of the Japanese disk drives involved in the complaint.

The complaint names Mitsubishi Electronics Corp. and its U.S. subsidiary, Mitsubishi Electronics America, Inc.; Teac Corp. and its U.S. subsidiary, Teac Corp. of America; and Sony Corp. and its U.S. subsidiary, Sony Corp. of America.

'Imminent demise' of industry

Tandon's complaint, filed Dec. 6, warned of the "imminent demise" of the U.S. floppy disk drive industry as a result of the alleged Japanese infringements. U.S. disk drive manufacturers have been hurt by competition from Japanese imports. The suit cites the estimate of industry analyst James N. Porter, editor of the "Disk/Trend Report" newsletter, that the Japanese will be the world leader in floppy disk sales by 1985.

In a related action, Tandon filed a patent infringement suit in U.S. District Court in Los Angeles against the same Japanese parent firms and subsidiaries. The suit seeks to bar further sales of the Japanese disk drives. It also seeks unspecified damages and asks that the damages be trebled as a result of the alleged "willfull, deliberate and intentional" patent infringement.

Spokesmen for the Teac subsidiary in Montebello, Calif., the Mitsubishi subsidiary in Torrance, Calif., and the Sony subsidiary in Compton, Calif., said they have not yet received copies of the complaint and would not comment until they do so.

Complaint's allegations

The complaint alleges that Mitsubishi and Teac have imported double-sided floppy disk drives through their American subsidiaries that infringe upon patents held by Tandon. It further charges that Sony, through its subsidiary, has imported 3½-in. double-sided floppy disks that constitute an infringement of Tandon patents.

The Tandon complaint claims that the patent is "one of the most valuable in the floppy field," having enabled Tandon to manufacture double-sided floppy disks that could be mass-produced at a low cost. Tandon further claimed that the invention "has been a major factor in sustaining the explosive growth of the microcomputer industry."

Tandon said it has granted licenses for the patent to several U.S. manufacturers, including IBM; Hewlett-Packard Co.; Shugart Associates, Inc.; Magnetic Peripherals, Inc.; and Micro Peripherals, Inc. The suit claimed that, because of Japanese competition, Micro Peripherals has since gone out of business, and Shugart decided to close a large portion of its California disk drive facility in October.

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TI to lay off 2,000; continued chip sales decline cited

DALLAS — Texas Instruments, Inc. recently announced plans to begin cutting approximately 2,000 jobs from its work force next month. The company cited the "continued weakening of the worldwide semiconductor market."

The TI development, which followed by one week Honeywell, Inc.'s announcement that it plans to lay off 1,000 people at its Synertek, Inc. semiconductor unit and intends to sell the subsidiary, indicates that semiconductor orders, which have slumped over the past few months, may not rebound as quickly as industry participants had expected [CW, Oct. 29].

The layoffs at TI will primarily affect its Texas facilities, the company said. Additionally, reduced work schedules are being implemented in some plants, according to TI.

Reportedly, the job cuts will reduce by 5% the portion of TI's work force engaged in semiconductor manufacturing, the largest portion of the company's business.

TI said employees affected by the reductions will either receive severance pay or be placed on furlough. Those on furlough will receive compensation from TI to supplement unemployment compensation for up to 26 weeks and will continue to have benefits coverage during the period in which they receive the supplemental compensation.

Over the past few months, book-to-bill ratios, which compares new orders with shipments, reported by the Semiconductor Industry Association have plummeted to new lows. In September, the rate of new orders fell below shipments for the first time in two years and has slipped even lower since then.

Industry observers and participants told *Computerworld* in October that the decline was probably due to the tendency of systems developers to double-order from chip manufacturers during periods of high demand.

Those observers had expected the situation to level off by the end of the year. The recent developments, however, indicate that the situation has worsened and suggest that the industry may be poised on yet another of the cyclical slumps that it has traditionally suffered during a slowdown in economic activity.

SBS appoints IBM executive to presidency

MCLEAN, Va. — Satellite Business Systems (SBS) last week named Marvin L. Mann as its president and chief executive officer, replacing Steven B. Schwartz, who was appointed assistant group executive for IBM's Telecommunications Products organization in the Information Systems and Communications Group.

Mann was previously vice-president and general manager of IBM's Lexington Business Products unit in Lexington, Ky.

Schwartz has been assigned the role of overseeing the incorporation of the latest IBM acquisition — Rolm Corp. — into IBM's business operations. He will retain a role at SBS as a member of the executive committee.

IBM owns 60% of the SBS partnership, and Aetna Life & Casualty Co. of Hartford, Conn., owns 40%. IBM recently increased its ownership share of SBS, buying out one-third of the interest in the Communications Satellite Organization.

SBS is a nationwide telecommunications company serving more than 150,000 business and residential subscribers.

COURT

from page 73

about the NCR Comten program to IBM in violation of federal licensing and copyright laws.

Since then, the impending courtroom battle has widened to include assertions by NCR Comten that IBM violated federal antitrust laws and a request by Evergreen for damages against NCR Comten, based on the allegation that it called Evergreen "an IBM spy" and damaged the firm's future business.

Evergreen lawyer James Keir claimed "Evergreen just got caught in the middle." The company was doing a straightforward investigation, he said, asking several manufacturers, including NCR Comten, to provide technical manuals for devices competing with the IBM 3705 when the alleged violation was discovered.

NCR Comten attorney Raymond Fitzsimmons said no definite date has been set for the trial, which is expected to begin early next year.

Mark Steinberg, a spokesman for O'Melveny & Myers, the Los Angeles-based legal firm representing IBM in the case, said Evergreen "acted properly in reporting the apparent theft of IBM's property" by NCR Comten. Steinberg would not comment on IBM's strategy but claimed that NCR Comten's allegations are "without merit" and that "IBM plans to respond vigorously to [NCR Comten's] antitrust allegations."

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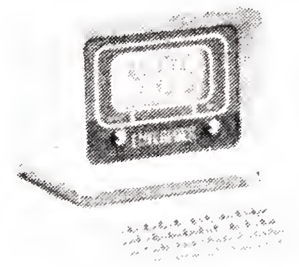

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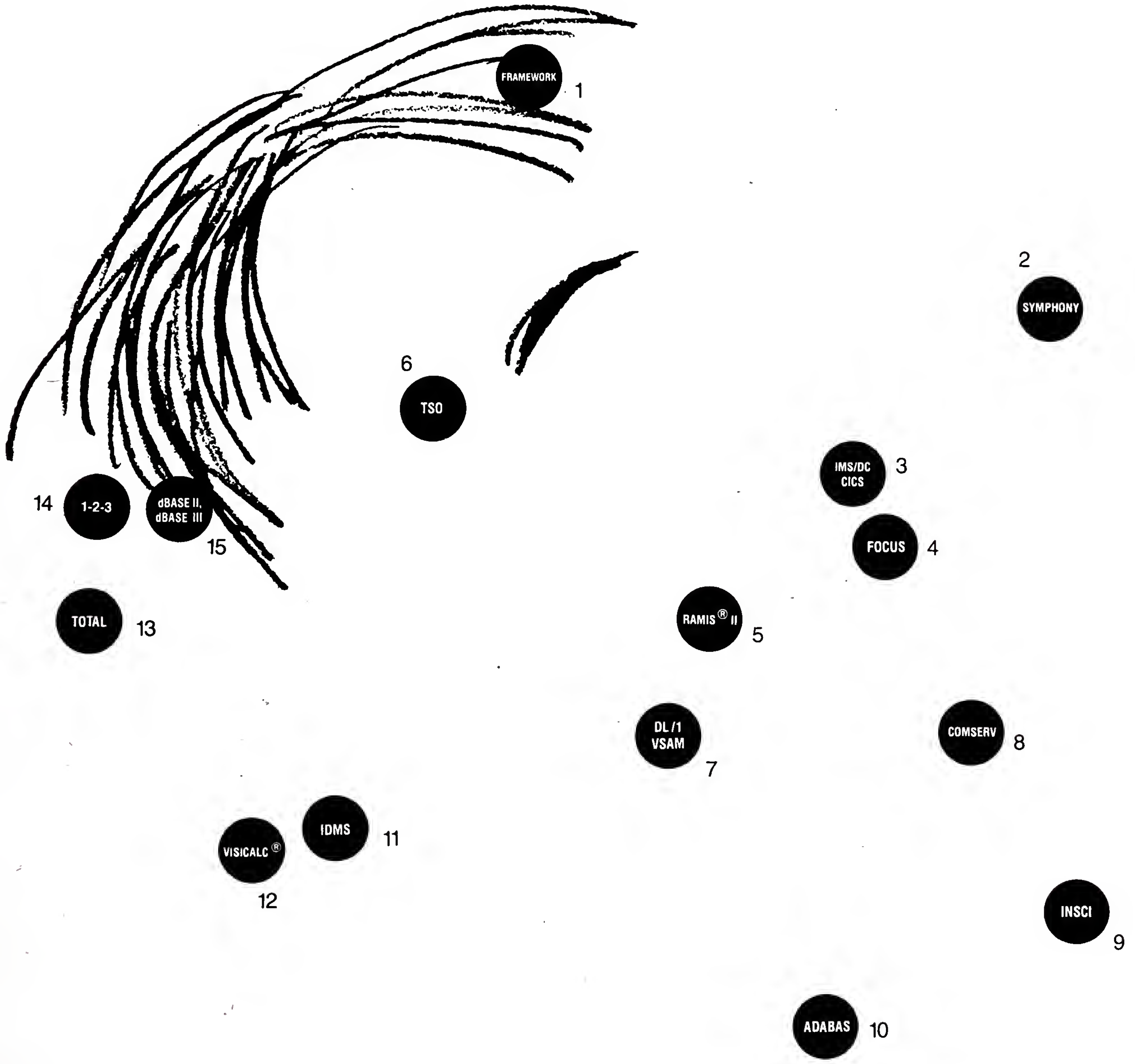

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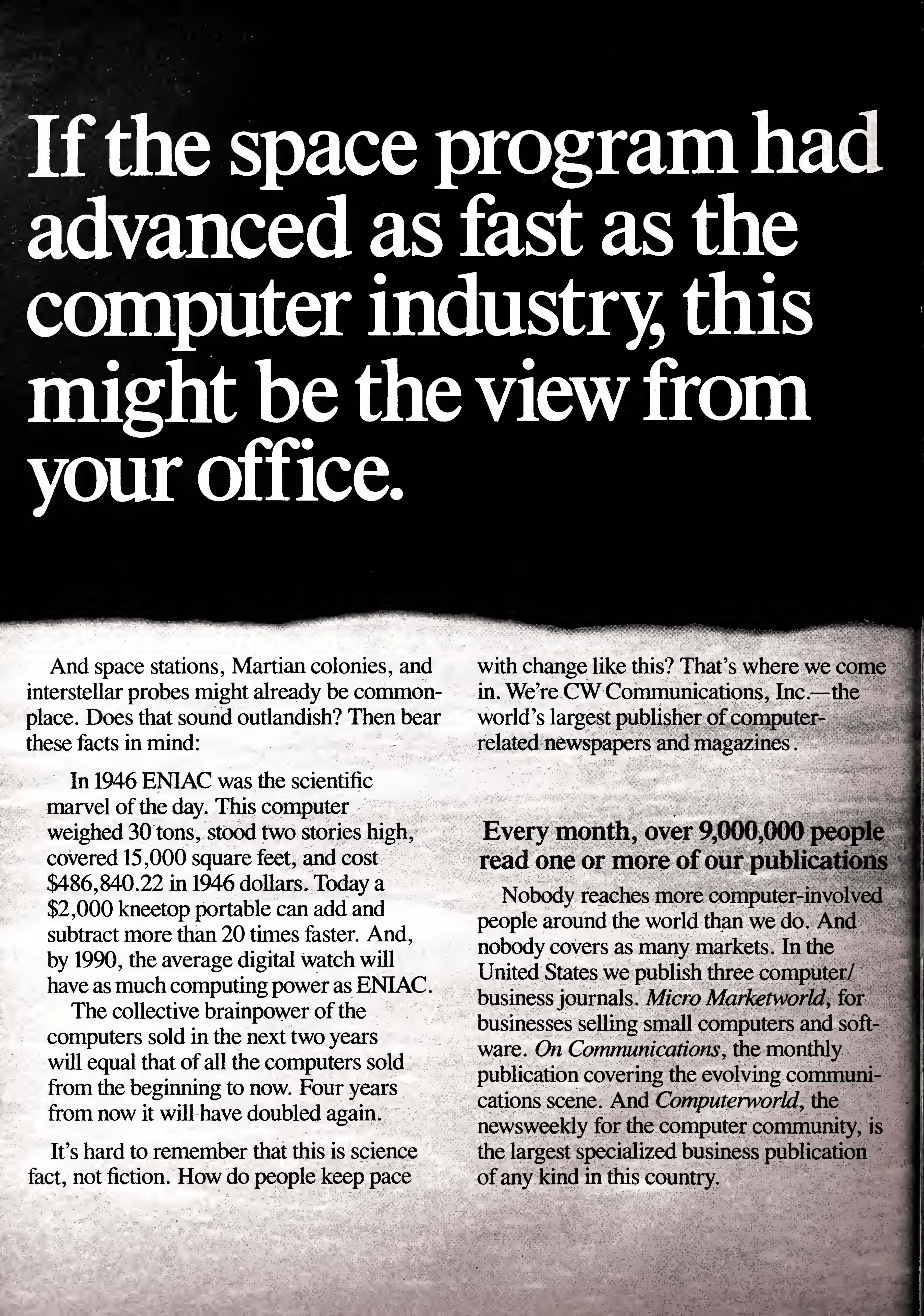

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AEA

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that the answer to that question is basically no — though there are differences on how to get at a solution. In its latest report on the situation, the AEA warned that a shortage of engineering faculty at U.S. universities may lead to a decline in the quality of electrical and computer science engineers. With not enough engineering teachers to fill vacant teaching slots, some engineering schools have had to turn away qualified high school applicants, the AEA said.

The AEA has been troubled by the problem for some time. A 1981 study by the AEA projected a shortage of 129,000 electrical and computer science engineers by 1985. Yet another study, issued last year using data compiled during the recession months of early 1983, pegged the shortage at 113,000 by 1987.

The latest study noted that, in the past decade, enrollments of engineering students have doubled, while the number of engineering faculty has risen just 10%.

According to the study, this imbalance has meant more crowded classrooms, course cancellations, increased teaching loads, less time for faculty research and more dependence on part-time faculty and teaching assistants.

In the AEA's view, a resolution to the faculty and student shortages is essential if American computer companies are to stay economically competitive. "A sufficient faculty supply is essential both to the quality and quantity of these [engineering] graduates," concluded Pat Hill Hubbard, the AEA's vice-president of engineering and technical education, who prepared the report.

But is the engineering shortage really as big a problem as the AEA purports? Like the AEA, the National Science Foundation concluded in its own recent study that the demand for computer and electrical engineers and computer scientists will grow by 10% to 15% during the next several years, and that there will be a significant shortage of computer scientists. The science foundation, however, foresaw that the shortage of engineers will be met by people crossing over into the field from other occupations.

The AEA is not convinced that the shortage problem can or should be resolved in the way proposed by the science foundation. So the trade association has worked to tackle the problem by its own methods.

AEA member companies have contributed $7 million through the AEA's Electronics Education Foundation. This money goes mainly to fund loans and fellowships for doctoral students in electrical or computer engineering or computer science. More than 120 graduate students at more than 30 universities are now receiving these fellowships. The AEA believes that without an increasing number of U.S. citizens receiving Ph.D.'s in engineering, more faculty posts will continue to go to foreign-born Ph.D.'s.

In other efforts, the AEA has lobbied federal and state lawmakers to raise salaries of engineering faculty, to provide tax incentives for corporations donating computer equipment and to provide matching grants with state legislatures to fund a variety of higher education initiatives.

ROBOTS

from page 73

the RIA said, indicates that total 1984 shipments will reach $290.3 million or more, compared with total 1983 shipments of $194.4 million.

"More robots have been shipped in 1983 and 1984 [combined] than in the previous 20 years combined, dating back to the development of the technology," Weisel noted. RIA figures show that 3,060 robot units were shipped in 1983, and at least 3,951 will have been shipped in 1984.

Based on new orders, the RIA said, the average price of an industrial robot dropped from $74,100 in 1983 to $59,200 in mid-1984. Weisel attributed the price cuts mostly to stiff competition in the U.S. market and, to a lesser extent, economies of scale in robot manufacturing.

He added that while prices have dropped about 20%, there has been a concurrent 20% increase in robot capabilities, due to advances in software, computer interfacing and sensory abilities.

Weisel and Vincent said the number of industrial robots installed in the U.S. has risen from 9,400 in 1983 to about 13,000 today, a number still far below the 41,000 robots installed in Japan. Vincent asserted that the U.S. robots tend to be more sophisticated technically and have better applications software than the Japanese robots.

Because the Japanese government subsidizes its robot industry, Vincent said, the U.S. industry will ask Congress in 1985 for tax incentives to improve its competitive position.

Robert Smith, RIA's lobbyist here, expressed concern that the Department of the Treasury's recent proposal for business tax reform would sharply reduce the ability of manufacturing industries to invest in robot systems. He cited the proposals to eliminate the 10% investment tax credit and the accelerated depreciation schedule that was enacted in 1981 [CW, Dec. 10].

On another subject, the RIA officials said that robots will not cause substantial unemployment in the next few years because robots typically replace other equipment rather than human laborers, and employment in the robotics industry itself now outstrips any unemployment caused by the robots. However, the officials stressed that worker retraining programs are needed to prevent widespread job displacement in the next century if a robot boom develops.

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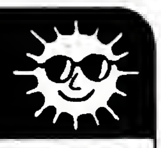

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The Director of Computer Services is responsible for leadership in academic and administrative computing services, for long-range planning and creative applications of the computer on campus; for budgeting and management of the computer center, and for effectively communicating to and with users with diverse needs. The college has two VAX systems, a computer science program with 120 majors, and a large faculty/student user group. The Director reports to the President. A masters's degree and at least three years' experience in an academic institution preferred. The position is available immediately or can be assumed during the summer 1985. Salary negotiable. Letter of application, three letters of reference, and transcripts to Mrs. Martha A. Farver-Apgar, Director of Personnel, Elizabethtown College, Elizabethtown, PA 17022.

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The Director General
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Institute of Public Administration
P.O. Box (205), Riyadh 11141
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Applicants are required to give their addresses and telephone numbers in order to be easily notified of the date of personal interview upon initial approval.

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Computer Services;

Director Of Computer Center

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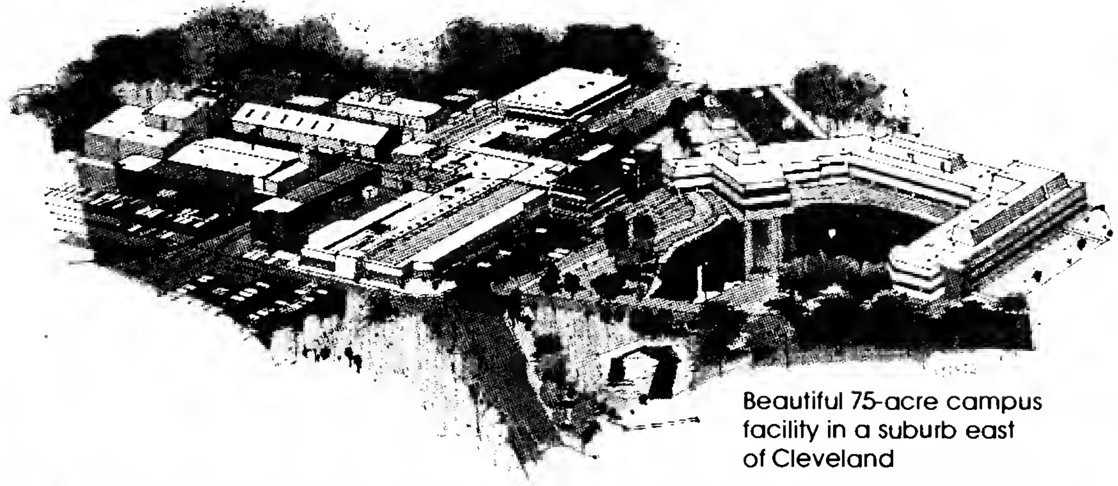

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Personnel Agency

Eastern Washington University has a one-year teaching position available in the Management Information Systems department for the 1985-1986 academic year. Teaching duties will consist of undergraduate courses in Administrative Office Management and Business Communications. Applicants must have a masters degree with emphasis in Administrative Office Management, Record Systems and Business Communications, or a doctorate/ABD in the Administrative Office Mangement area. Eastern has campuses in Spokane and in nearby Cheney, and its business programs are AACSB accredited. Applicant files will be reviewed beginning December 1984.Vita should be directed to: Dr. Frank Nelson, Chairman, Department of Management Information Systems, School of Business, Eastern Washington University, Cheney, WA 99004. An equal Opportunity Employer.

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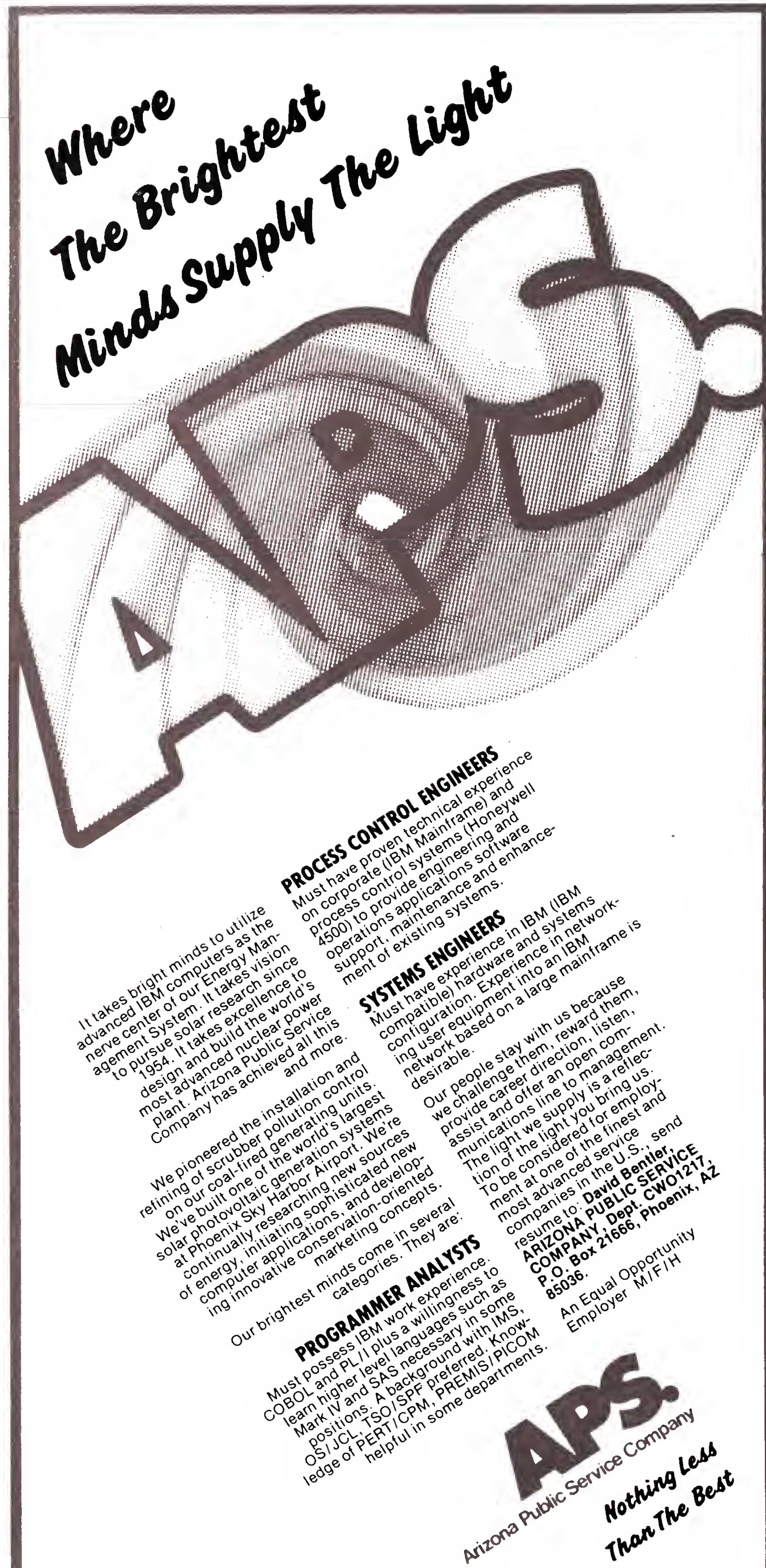

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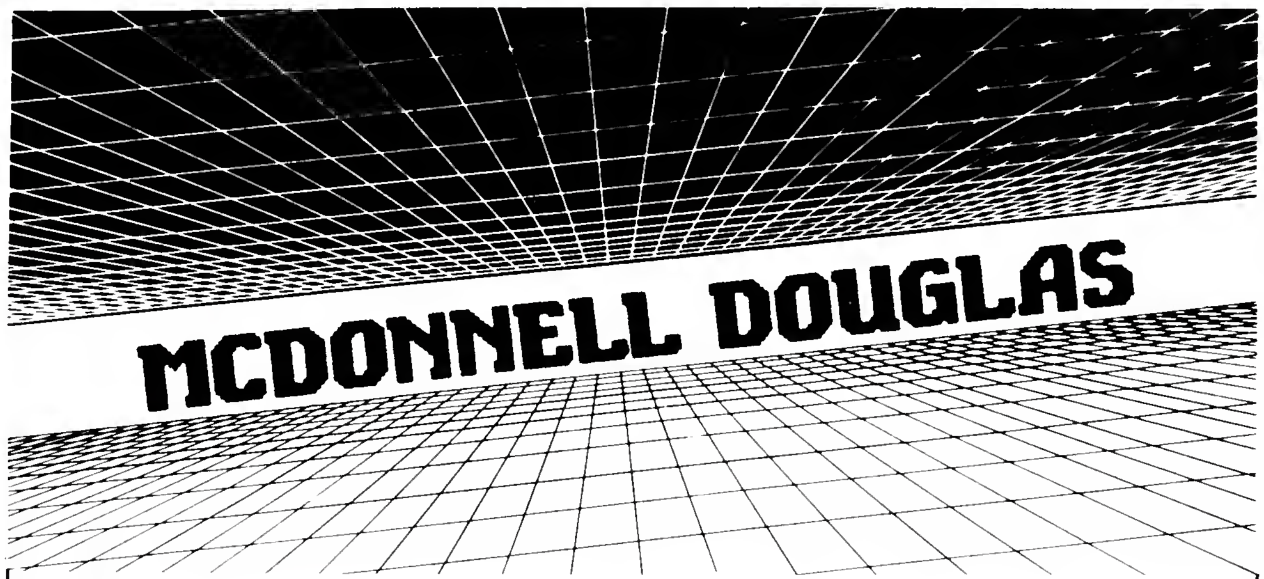

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QUALIFICATIONS REQUIRED:

- Relevant baccalaureate degree
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• PROGRAMMER ANALYSTS

Senior candidates will have systems design experience and 3-5 years of programming experience. Good communications skills are required because of the extensive user interaction that will take place while designing many new systems. No old systems currently exist that need to be interfaced to, enhanced, or maintained. A working knowledge of RPG III, Basic, or COBOL is required. System 38/36/34, or System/3 experience is a plus. We are seeking ambitious, self-starters who have a desire to use their developemental skills in multiple System 38's environment.

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- Experienced with DECnet, FORTRAN, Pascal or "C" desired

Computer Systems Analyst
- BSCS/BSEE/BS Math required; prefer MSCS/MSEE
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- Experienced with DECnet, FORTRAN, Pascal or "C" desired

To arrange for an immediate interview, please call Jerry Horna at 301-279-4444 or 800-638-8512. If a call is not convenient at this time, please send your resume to: TRACOR, INC., Dept. E-137, 1601 Research Boulevard, Rockville, MD 20850. We are an Equal Opportunity Employer.

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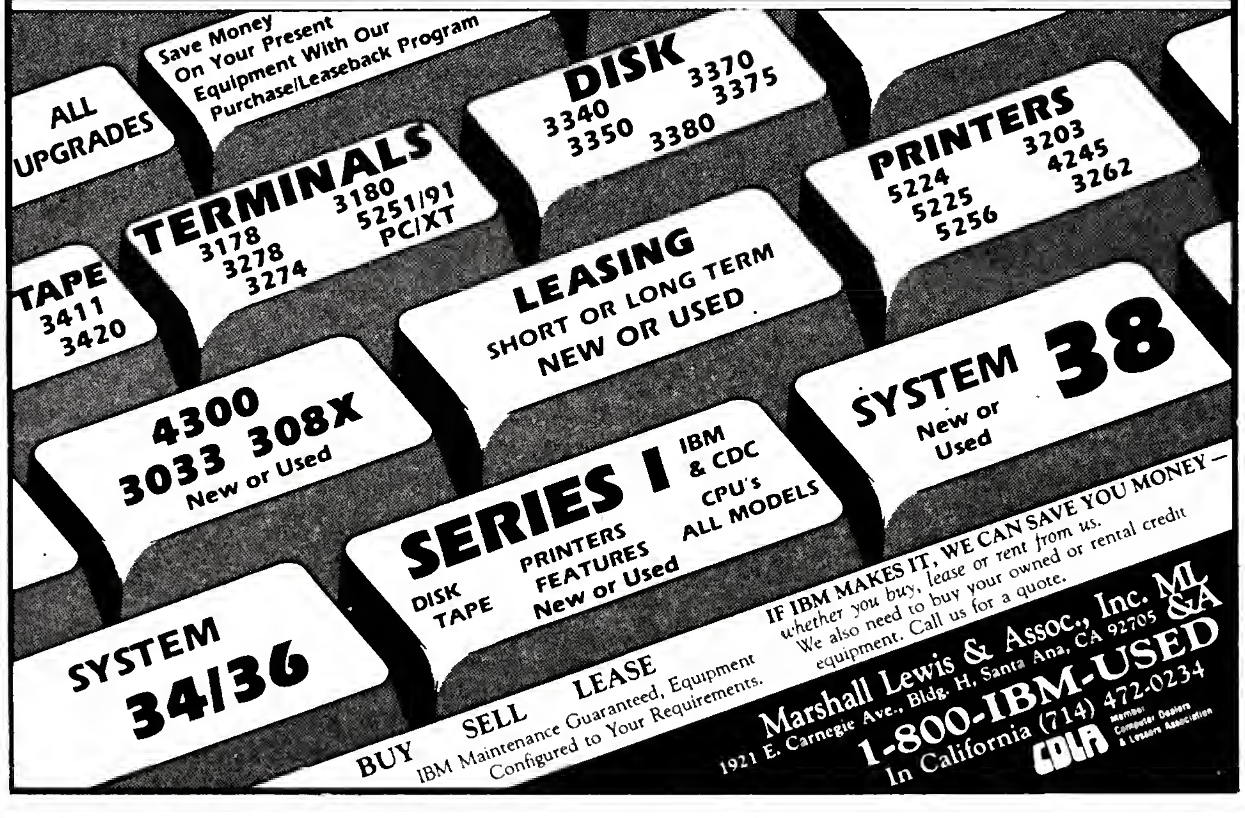

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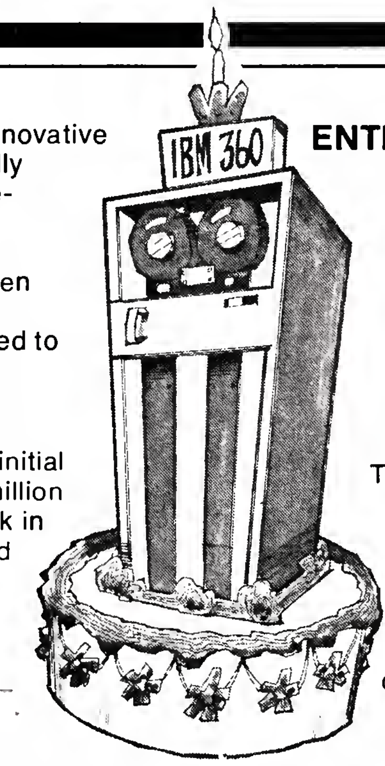

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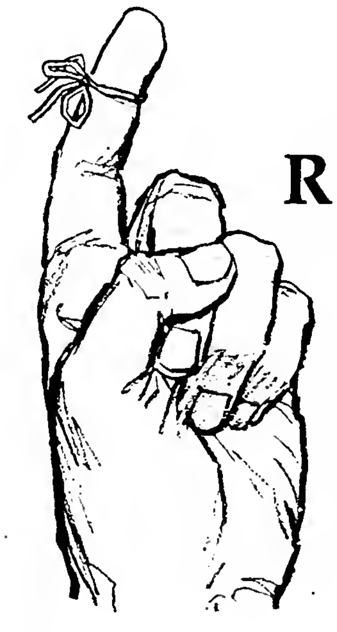

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We would also like to remind you of the early closing for our Combo issue of December 31/January 7th. Classified Closing is December 20th. Please be sure to contact our offices with your space to be in the first issue of 1985. Let us help you start 1985 off on the right foot!

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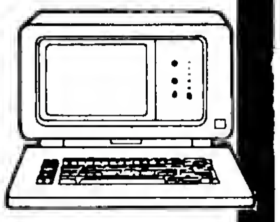

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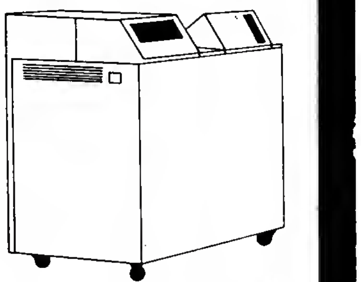

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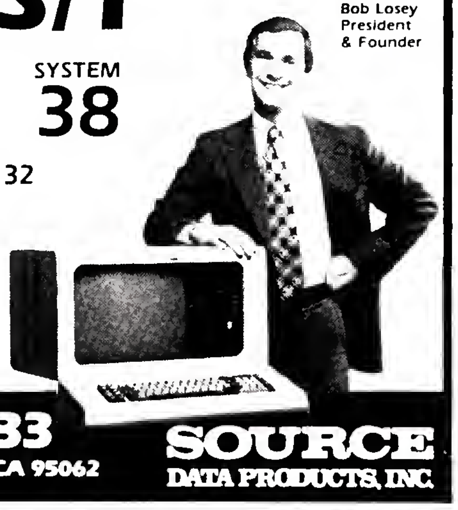

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COMPUTERWORLD

COMPUTERWORLD's paid circulation climbed to over 126,000 this fall. Folio 400 (Folio Magazine's study of trade publication performance) placed us first in total revenue. As the industry grows, so will **COMPUTERWORLD.** It will continue to offer the high quality news coverage and editorial content that has attracted its readers. What does that mean to you, our advertisers? Good news...in the form of wide exposure.

The Classified section of the newspaper is laid out in an attractive format and is easy to read. It offers classifications to solve a variety of problems: **Position Announcements, Positions Wanted, Buy • Sell • Swap, Software For Sale, Software Wanted, Time & Services, Real Estate, Publications, Bids & Proposals, Auctions, Seminars & Conferences** and **The Bulletin Board.**

Our **BULLETIN BOARD** section is ideal for the smaller companies who want a low-cost way to sell pieces of equipment (hardware or software). The **BULLETIN BOARD** is laid out as a quick reference for potential buyers who know what they are after.

So, as a nationwide publication, we give you the exposure you want. As a weekly publication, we give you the immediacy your advertisements need.

A number of special issues of **COMPUTERWORLD** are scheduled to run in 1985. Each of these issues will feature one aspect of the computer industry and give our advertisers a chance to reach a more select audience. These are the topics the issues will cover:

- December 31, 1984 & January 7, 1985 Combo Issue - **'85 Forecast** (There will be an early close for this issue on Thursday, December 20th)
- January 28 - **Applications Software Pkgs.**
- February 25 - **Communication Networks**
- March 25 - **Graphic Systems**
- April 29 - **Micros in Big Business**
- May 27 - **Manufacturing Systems**
- June 24 - **DBMS**
- July 8 - **NCC Preview**
- July 15 - **NCC Show** (early close July 3rd)
- July 22 - **NCC Wrap-Up**
- August 26 - **Software Productivity Packages**
- September 30 - **Minis & Small Business Systems**
- October 28 - **Data Communications Terminals**
- November 25 - **Protecting The Corporate Information Resource**
- December 30, 1985 & January 6, 1986 - **Forecast '86**

COMPUTERWORLD publishes every Monday with an ad deadline of 10 days prior to each issue date. (Notice early closing for combo issue.) You may send in copy to be pubset or camera-ready material (velox or negative) via the mail. We provide telecopier service and will also take ads over the phone.

Information concerning classified advertising rates, color costs, ad sizes, mechanical specifications along with more detailed information on the special issues is contained in the 1985 Rate Card #20 and Media Kit.

Our mailing address is
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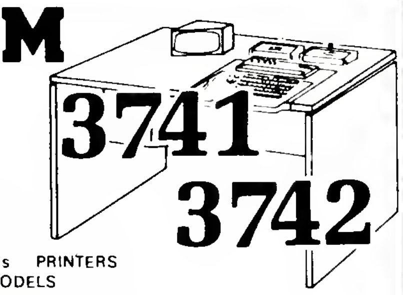

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How Does The Bulletin Board Work?

- The Bulletin Board is designed to advertise only one piece of equipment or software per unit.
- Units are one column wide by one inch deep at a cost of $ 140.00 per column inch. Although several units may be purchased for one advertisement, there will be no quantity discount.
- All ads are standard in format and typeface. No special typeface, borders or logos are allowed. Copy may be up to 25 words per unit.
- The Bulletin Board ads are listed by manufacturer or by product type under appropriate headlines.
- Ads are set on a six-column page in our classified section under "The Bulletin Board".

How to Place an Ad in the Bulletin Board:

- We suggest you prepare your ad before contacting us. Here are some guidelines:
  The first line is set in larger, bold type and should contain standard equipment identification.
  The body copy should describe the equipment and state the price.
  The closing should supply the seller's name and telephone number.
  This is all the information an interested buyer needs for follow up.
- Ads are accepted by mail, phone or by telecopier.
- Deadline is 7 days in advance of Monday issue.
- If you have never advertised with **Computerworld,** we request a check with your order.
- The Bulletin Board ads are not agency commissionable nor may they be applied to contract advertisers inch count.
- We assume no liability for errors beyond the price of the ad.

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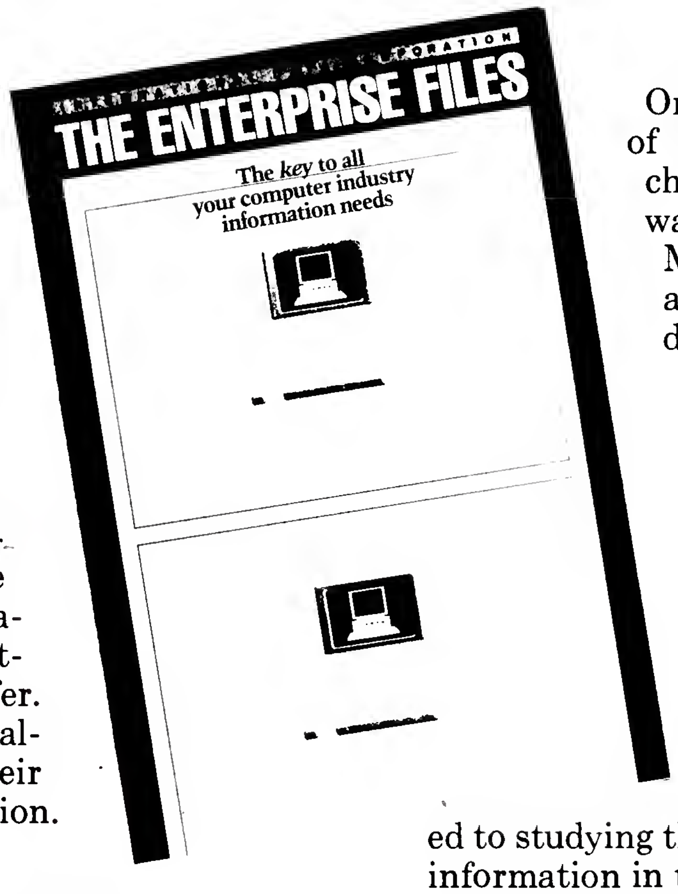

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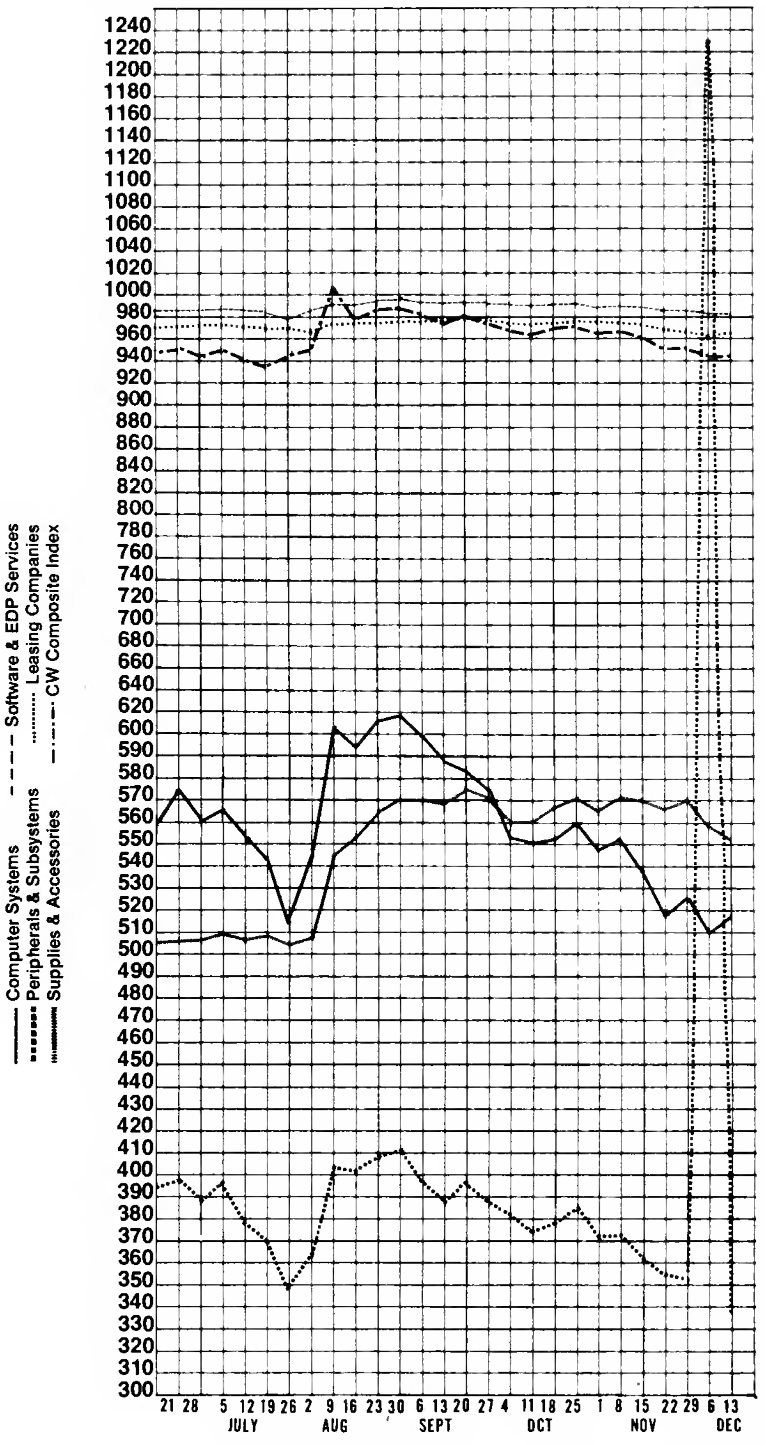

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EXCH		PRICE 1983-84 RANGE (1)	CLOSE DEC 5 1984	WEEK NET CHNGE	WEEK PCT CHNGE
	COMPUTER SYSTEMS				
O	ALPHA MICROSYSTEMS	6- 24	5 5/8	-2 1/2	-30.7
O	ALTOS COMPUTER SYST	7- 21	7 1/8	-1 1/8	-13.6
A	AMDAHL CORP	10- 30	11 1/4	0	0.0
O	APPLE COMPUTER INC	18- 63	26 1/8	+ 1/4	+0.9
N	AT&T	15- 21	18 7/8	+ 1/4	+1.3
N	BURROUGHS CORP	44- 59	54 5/8	- 1/4	-0.4
O	COMPAQ COMPUTER CP	4- 15	4 1/8	- 3/8	-8.3
O	COMPUTER AUTOMATION	4- 17	4 1/8	- 1/4	-5.7
A	COMPUTER CONSOLES	8- 26	8 1/8	- 1/4	-2.9
N	CONTROL DATA CORP	25- 62	35	+ 3/8	+1.0
O	CONVERGENT TECHNOL	5- 41	4 3/4	-1 1/8	-19.1
N	CRAY RESEARCH INC	39- 58	49	-2 1/4	-4.3
O	DAISY SYSTEMS CORP	14- 28	24 3/4	-1 1/4	-4.8
N	DATA GENERAL CORP	27- 59	53 3/8	- 7/8	-1.6
N	DATAPOINT CORP	14- 31	17 1/2	+ 1/2	+2.9
N	DIGITAL EQUIPMENT	64-125	101 3/8	-4 1/2	-4.2
A	EECO INC	12- 16	14 5/8	+1	+7.3
N	ELECTRONIC ASSOC.	3- 15	3 1/4	- 1/4	-7.1
N	FLOATING POINT SYST	13- 44	16	+ 1/4	+1.5
N	FOXBORO	28- 47	29 3/4	- 3/8	-1.2
O	GENERAL AUTOMATION	6- 16	5 7/8	+ 3/8	+6.8
N	GOULD INC	20- 44	20 1/8	-1 5/8	-7.4
N	HARRIS CORP	23- 49	28 1/8	-1 1/4	-4.2
N	HEWLETT-PACKARD CO	31- 48	32 3/4	- 1/2	-1.5
N	HONEYWELL INC	46- 69	57	- 5/8	-1.0
N	IBM	103-134	117 7/8	-5 1/4	-4.2
O	IPL SYSTEMS INC	1- 14	1 3/8	- 1/4	-15.3
N	ITT CORP	21- 47	30 1/4	+3	+11.0
N	M/A-COM INC	13- 35	15 7/8	-2 1/8	-11.8
N	MANAGEMENT ASSIST	9- 29	27 1/2	- 1/8	-0.4
N	MATSUSHITA ELEC(ADR)	56- 88	56 3/8	-1 1/8	-1.9
N	MODULAR COMPUTER SYS	6- 16	6 1/4	- 1/4	-3.8
N	MOHAWK DATA SCI	9- 17	11 1/4	+ 1/2	+4.6
N	MOTOROLA INC	29- 49	33	+1 1/8	+3.5
N	NAT'L SEMICONDUCTOR	11- 20	11 5/8	+ 1/8	+1.0
N	NBI INC	15- 36	15 1/8	+ 1/4	+1.6
N	NCR	21- 34	25 5/8	- 1/4	-0.9
N	PERKIN-ELMER	18- 37	24 5/8	- 3/4	-2.9
N	PRIME COMPUTER INC	11- 26	15 1/4	-1	-6.1
N	SPERRY CORP	35- 50	37 1/4	- 1/2	-1.3
O	STRATUS COMPUTER INC	9- 17	9 1/4	- 1/4	-2.6
O	TANDEM COMPUTERS INC	15- 40	17 1/2	- 3/4	-4.1
N	TANDY CORP	24- 62	23 1/2	- 7/8	-3.5
O	TELEVIDEO SYSTEMS	3- 41	2 3/4	- 1/8	-4.3
O	TELXON CORP	8- 17	15	- 3/4	-4.7
N	TEXAS INSTRUMENTS	101-169	117 7/8	- 1/2	-0.4
A	ULTIMATE CORP	14- 24	14 1/4	- 3/4	-5.0
O	VECTOR GRAPHICS INC	0- 9	1/8	0	0.0
A	WANG LABS "B"	24- 42	26 1/2	- 7/8	-3.[illegible]
A	WANG LABS "C"	24- 42	26 1/4	-1 1/8	[illegible]
N	XEROX CORP	35- 52	36 1/8	-1 7/8	[illegible]
	LEASING COMPANIES				
O	BOOTHE FINANCIAL CP	10- 22	[illegible]	- 3/8	-1.8
A	CMI CORP	4- [illegible]	[illegible] 5/8	- 7/8	-13.4
N	COMDISCO INC	9- [illegible]	[illegible] 1/2	+ 5/8	+7.0
O	CONTINENTAL INFO SYS	5- [illegible]	4 5/8	-1 5/8	-26.0
N	DPF INC	[illegible]	15 1/2	+ 1/4	+1.6
O	FINALCO GROUP [illegible]	[illegible] 12	4	- 1/4	-5.8
O	PHOENIX AM[illegible]	4- 17	3 3/4	- 1/8	-3.2
O	SELECTER[illegible]NC	8- 21	8 1/4	-1 1/4	-13.1
N	U.S.[illegible]G	29- 44	34 1/2	- 3/4	-2.1
	COMPONENTS				
N	ADVANCED MICRO DEV	25- 41	28 1/4	+1 1/4	+4.6
O	ADV'D SEMICONDUCTOR	15- 38	14 3/4	- 1/2	-3.2
N	ANALOG DEVICES INC	20- 32	22 1/2	-1 1/2	-6.2
O	ANALOGIC CORP	10- 31	11 1/2	-1	-8.0
N	APPLIED MAGNETICS CP	9- 37	9	- 1/4	-2.7
O	HADCO CORP	5- 12	5 1/4	-1 5/8	-23.6
O	MICRO MASK INC	10- 19	9 5/8	- 5/8	-6.0
N	TERADYNE	22- 39	21 7/8	-2 3/4	-11.1
	SOFTWARE & EDP SERVICES				
O	ADVANCED COMP TECH	2- 8	2 1/4	+ 1/8	+5.8
N	ADVANCED SYSTEMS INC	13- 22	12 1/2	- 3/8	-2.9
O	AGS COMPUTERS INC	10- 32	10 3/4	+ 1/8	+1.1
O	AMERICAN SOFTWARE	12- 31	12 3/8	-1 1/8	-8.3
N	ANACOMP INC	2- 19	1 5/8	- 1/4	-13.3
O	ANALYSTS INTL CORP	5- 17	4 1/2	- 1/2	-10.0
A	APPLIED DATA RES	18- 37	25 3/8	-1 3/4	-6.4
O	ASHTON TATE	6- 15	6 1/4	- 1/2	-7.4
O	ASK COMPUTER SYSTEMS	13- 21	15 1/4	-1 3/4	-10.2
B	ASTRADYNE COMP IND	1- 7	1 1/2	0	0.0
N	AUTOMATIC DATA PROC	30- 44	35 1/4	- 7/8	-2.4
O	COMPUTER ASSOC INT'L	15- 35	16 7/8	- 3/8	-2.1
O	COMPUTER HORIZONS	8- 20	6 1/4	+ 1/8	+2.0
O	COMPUTER NETWORK	5- 11	8 5/8	- 1/8	-1.4
N	COMPUTER SCIENCES	11- 23	15 1/4	+ 7/8	+6.0
O	COMPUTER TASK GROUP	12- 19	14 1/4	- 1/4	-1.7
O	COMPUTER USAGE	4- 18	4 3/8	- 5/8	-12.5
O	COMPUTONE SYSTEMS	4- 23	6	-1	-14.2
O	COMSERV CORP	1- 16	2 7/8	- 1/4	-8.0
O	COMSHARE	7- 14	6 1/2	0	0.0
N	CULLINET SOFTWARE	24- 50	40 5/8	-3 1/8	-7.1
O	CYCARE SYSTEMS INC	16- 25	19	- 1/4	-1.2
O	HOGAN SYSTEM INC	8- 27	7 3/4	-1 1/4	-13.8
N	GENERAL ELECTRIC CO	45- 59	54 5/8	-1 3/4	-3.1
N	GTE CORP	36- 48	39	- 5/8	-1.[illegible]
N	INFORMATICS GENERAL	15- 32	15 7/8	+ 1/4	[illegible]
O	INFORMATION SCIENCE	4- 17	4 1/4	- 1/2	[illegible]
O	INFOTRON SYSTEMS CP	15- 43	15	[illegible]	[illegible]
O	KEANE ASSOCIATES	6- 15	9 1/2	[illegible]	[illegible]
A	LOGICON	18- 31	24 1/[illegible]	[illegible]	-4.9
O	LOTUS DEVELOPMENT CP	15- 40	22 [illegible]	[illegible]	-3.2
O	MCI COMMUNICATIONS	6- 28	7 3/[illegible]	- 1/2	-6.3
O	MNGT SCI AMER INC	9- [illegible]	[illegible]	- 1/8	-1.2
O	MATHEMATICAL APP GRP	[illegible]	[illegible]	- 1/2	-6.6
O	MICOM SYSTEMS INC	28[illegible]	28	-4 3/4	-14.5
O	MICROPRO INT'L CP	2- [illegible]	2 1/4	0	0.0
O	NATIONAL DATA [illegible]	[illegible]- 26	9	+ 1/2	+5.8
O	ON-LINE SOFT[illegible]	5- 29	5	0	0.0
O	PANSOPHI[illegible]	11- 30	13	0	0.0
N	PLAN[illegible]NG [illegible]ARCH	10- 21	11 7/8	+ 1/4	+2.1
[illegible]	[illegible] MGMT SYSTS CP	22- 35	24 1/2	- 1/2	-2.0
[illegible]	[illegible]MMING & SYS	4- 8	4 1/2	0	0.0
O	[illegible]NOLDS & REYNOLD	28- 53	30 1/2	-1 1/2	-4.6
[illegible]	SEI CORP	11- 34	13 1/4	- 3/4	-5.3
O	SHARED MEDICAL SYST	23- 43	23 7/8	- 3/8	-1.5
O	SCIENTIFIC COMPUTERS	5- 14	5 1/8	- 1/4	-4.6
O	SOFTWARE AG	9- 15	13 3/8	- 7/8	-6.1
N	URS CORP	10- 18	12 1/4	- 1/8	-1.0
N	UCCEL	7- 17	11 1/2	0	0.0
	PERIPHERALS & SUBSYSTEMS				
P	AM INTERNATIONAL	2- 7	2 3/4	- 1/8	-4.3
A	ANDERSON JACOBSON	4- 26	4	- 5/8	-13.5
O	AUTO-TROL TECHNOLOGY	8- 29	7 3/4	- 1/2	-6.0
O	AVANT-GARDE COMPUTNG	15- 29	16	- 3/4	-4.4
O	BANCTEC INC	5- 22	6	- 1/2	-7.6
A	BEEHIVE INT'L	1- 11	5/8	0	0.0
N	BOLT,BERANEK & NEW	17- 30	20 7/8	+1 1/8	+5.6
O	CAMBEX CORP	1- 3	1 1/2	0	0.0
N	CENTRONICS DATA COMP	8- 28	8 3/4	- 1/2	-5.4
A	CETEC CORP	7- 12	7	- 1/8	-1.7
A	COGNITRONICS	4- 20	3 1/2	- 3/8	-9.6
N	COMPUGRAPHIC CORP	26- 40	26 5/8	- 3/8	-1.3
O	COMPUTER TRANSCEIVER	1- 10	1/2	-[illegible]	[illegible].9
N	COMPUTERVISION CORP	29- 53	36 5/8	[illegible]	[illegible]
N	CONRAC CORP	11- 24	13 1/[illegible]	[illegible]	-0.9
A	DATAPRODUCTS CORP	14- 32	13 [illegible]	-1[illegible]	-6.8
A	DATARAM CORP	4- 12	3[illegible]	- 3/8	-8.8
O	DATA SWITCH CORP	5- [illegible]	5 [illegible]	- 1/8	-2.3
O	DATUM INC	[illegible]	[illegible]/8	- 3/4	-11.7
O	DECISION DATA COMPUT	9[illegible]	10 5/8	- 1/4	-2.2
O	DOCUTEL-OLIVETTI	4-[illegible]	3 1/2	- 7/8	-20.0
N	ELECTRONIC M [illegible]	[illegible]- 11	4 3/4	-1	-17.3
O	ENDATA, INC	7- 16	7	- 1/4	-3.4
O	EVANS & [illegible]	12- 50	12 1/2	- 5/8	-4.7
O	GAND[illegible]	9- 14	10	-2 5/8	-20.7
N	[illegible]OMM IND	10- 20	15 3/8	- 1/8	-0.8
N	[illegible] CORP	16- 33	28 7/8	-1 1/8	-3.7
O	[illegible] CORP	3- 8	4 1/4	+ 3/8	+9.6
[illegible]	[illegible]ORMATION INTL INC	10- 19	11 1/4	0	0.0
[illegible]	INTECOM INC	7- 21	8 3/4	0	0.0
O	INTEL CORP	27- 45	28 1/4	0	0.0
A	LUNDY ELECTRONICS	7- 19	10 3/8	0	0.0
O	MEGADATA CORP	8- 15	12 1/8	- 5/8	-4.9
A	MSI DATA CORP	9- 25	10 3/8	- 1/4	-2.3
N	NASHUA CORP	19- 29	26	+ 1/4	+0.9
O	NETWORK SYSTEMS CORP	16- 34	19 7/8	-3 5/8	-15.4
N	NO AMERICAN PHILIPS	30- 40	37 1/4	-2 3/4	-6.8
N	NORTHERN TELECOM LTD	30- 49	34 3/8	-2 1/4	-6.1
O	OMEX	1- 6	1/8	0	0.0
N	PARADYNE CORP	11- 26	11 7/8	- 5/8	-5.0
A	PENRIL CORP	9- 14	11	- 5/8	-5.3
N	PLESSEY CO (ADR)	24- 41	24 1/2	+ 3/4	+3.1
O	PRINTRONIX INC	13- 34	13 1/4	- 3/4	-5.3
O	RAMTEK CORP	4- 23	4 1/8	- 1/8	-2.9
N	RECOGNITION EQUIP	10- 17	13 1/4	0	0.0
N	SANDERS ASSOCIATES	36-120	37 3/4	-1	-2.5
O	SCAN DATA	1- 3	1/4	0	0.0
O	SCAN-TRON CORP	9- 19	12	+ 1/4	+2.1
N	SCIENTIFIC ATLANTA	8- 23	10 1/4	+ 3/4	+7.8
O	SEAGATE TECHNOLOGY	4- 20	4 1/2	+ 3/8	+9.0
N	STORAGE TECHNOLOGY	3- 23	2 3/4	- 3/8	-12.0
O	SYKES DATATRONICS	1- 13	1 1/8	-1 1/2	-57.1
O	SYSTEMS & COMP TECH	16- 39	15 3/4	-8	-33.6
A	T BAR INC	7- 17	7 1/4	+ 3/4	+11.5
A	TAB PRODUCTS CO	13- 20	17 1/4	- 3/8	-2.1
O	TANDON CORP	6- 35	5 3/4	- 7/8	-13.2
A	TEC INC	6- 12	8 1/4	- 1/8	-1.4
N	TEKTRONIX INC	52- 87	55 3/8	-2 3/8	-4.1
N	TELEX	19- 35	32	- 1/4	-0.7
O	TESDATA SYSTEMS CP	2- 17	2 3/4	+ 1/4	+10.0
N	TIMEPLEX INC	13- 23	17 5/8	-1 3/8	-7.2
O	VISUAL TECHNOLOGY	3- 26	2 3/4	0	0.0
	SUPPLIES & ACCESSORIES				
N	AMERICAN BUS PRODS	17- 23	20 7/8	- 1/8	-0.5
N	BARRY WRIGHT	22- 33	25 1/4	- 1/4	-0.9
A	DUPLEX PRODUCTS INC	22- 27	26 1/8	- 1/2	-1.8
N	ENNIS BUS. FORMS	18- 28	23 7/8	- 3/8	-1.5
N	3M COMPANY	69- 90	78 3/8	-2 7/8	-3.5
N	MOORE CORP LTD	35- 51	43 5/8	-1 7/8	-4.1
O	STANDARD REGISTER	27- 43	41	- 3/4	-1.7
N	WALLACE COMP SERVICE	23- 33	30 1/8	- 1/2	-1.6

EXCH: N=NEW YORK; A=AMERICAN; P=PACIFIC; B=BOSTON;
L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
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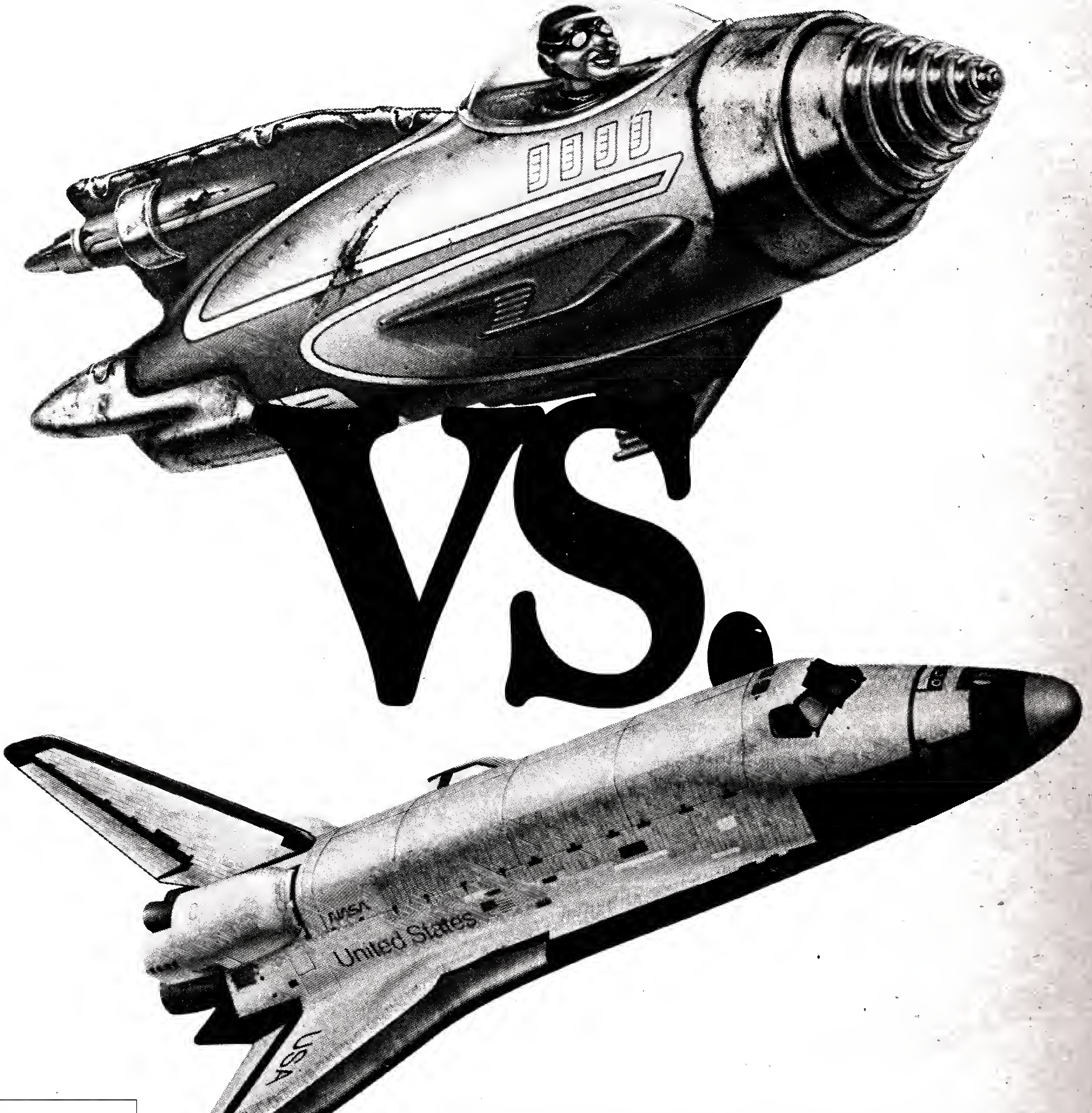

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